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**Part II. Language.** CLASSIFICATION OF LANGUAGES: Indo-European or Aryan Family; Semitic; Hamitic; Ural-Altaic or Scythian; Malay-Polynesian; Dravidian; Bantu; American; Australian; Isolated Languages; Universal Languages. PRACTICAL ENGLISH: Structure of Composition as a Whole; Structure of the Paragraph; Diction; Punctuation and Capitals; Proofreading; Argument and Debate; Forms of Public Speech; Journalism and Short Stories; Business English; Letters. DICTIONARY OF HOMONYMS; DICTIONARY OF WORDS FRE-

QUENTLY MISUSED; DICTIONARY OF PREPOSITIONS; DICTIONARY OF ABBREVIATIONS, CONTRACTIONS AND DEGREES; DICTIONARY OF FOREIGN WORDS AND PHRASES: From the Classic Languages; Modern Languages; Culinary Words and Phrases. . . . . 200

\* **General Bibliography of Language.**—Saxe: *Introduction to the Science of Language*. Whitney: *Language and the Study of Language*. Paul: *Principles of the History of Language*. Müller: *Science of Language*. Skeat: *Philology*. Jespersen: *Progress in Language*. With Special Reference to English. Giles: *Manual of Comparative Philology for Classical Students*. Oertel: *Lectures on the Study of Language*. Sweet: *Primer of Spoken English*. Skeat: *Etymological Dictionary of the English Language*. Sweet: *Grammar, Logical and Historical*. Whitney: *The Century Dictionary*. Webster: *New International Dictionary*. Fisk: *The Standard Dictionary*. Lewis: *Applied English Grammar*. Genuit: *Practical Elements of Rhetoric*. Gummere: *Poetics*. Wendell: *English Composition*. Jones: *Self-Cultivation in English*. Kittredge: *Words and Their Ways in English Speech*. French: *Study of Words*. Fernald: *Synonyms and Antonyms*.

**Part III. Literature.** GENERAL DEFINITION, ENGLISH LITERATURE: Anglo-Saxon Period; Norman-French Period; Elizabethan Period; Georgian Period; Romantic Period; Victorian Period. AMERICAN LITERATURE: Beginning of American Literature; Colonial Period; Period of Nation-Making; First Period of Nationalism; Second National Period. PARALLEL OUTLINES OF WORLD LITERATURE: From the Beginning to the Birth of Christ; From Jesus to Mohammed; From Mohammed to Dante; From Dante to the Reformation; Sixteenth Century; Seventeenth Century; Eighteenth Century; Nineteenth Century. DICTIONARY OF FAMOUS BOOKS, POEMS, AND DRAMAS; DICTIONARY OF LITERARY CHARACTERS AND ALLUSIONS; DICTIONARY OF PSEUDONYMS AND SOBRIQUETS; DICTIONARY OF MYTHS. . . . . 235

\* **General Bibliography of Literature.**—Jevons: *History of Greek Literature*. Mahaffy: *Greek Literature*. Crutwell: *History of Roman Literature*. Fortier: *History of French Literature*. Robertson: *History of German Literature*. Garnett: *Short History of Italian Literature*. Symonds: *Italian Renaissance*. Horn: *History of Scandinavian Literature and Jewish Encyclopedia*. Morley: *Library of English Literature*. Brooke: *History of English Literature*. Ward: *English Poets*. Gosse: *Short History of English Literature*. Tylor: *History of American Literature*. Matthews: *History of American Literature*. Steadman: *An American Anthology*. Johnson: *Elements of Literary Criticism*. Warner: *Library of Universal Literature*.

**Part IV. Science.** CLASSIFICATION OF SCIENCES: Concerning the Heavens; the Earth; Mass and Force; Molecules and Lesser Divisions of Matter; Living Organisms; Plants; Lower Animals or Concerning Man as an Organism; Man as a Member of Society; Exact Sciences. AERONAUTICS AND AVIATION: Table of Chief Events in Aeronautics. ASTRONOMY: Subdivisions; Solar System; Sun; Moon; Planets; Comets; Meteors; Stars; Nebula. BOTANY: Departments of Modern Botany; Cytology; Histology; Morphology; Physiology; Pathology; Ecology; Phytogeography; Phylogeny; and Taxonomy. Outline of Taxonomy, or Classification of Plants. CHEMISTRY: Substances; Physical Properties; Chemical Properties; Chemical Reaction; Molecular Hypothesis; Qualitative Analysis; Quantitative Analysis; Valence; Formulae; Thermochemistry; Electrochemistry; Photochemistry; Physical Chemistry; Inorganic Chemistry; Organic Chemistry; Chemical Elements. Chemistry of Foods. ENTOMOLOGY. ETHNOLOGY: Subdivisions; Origin of

Men; Unity of Mankind; Man's First Home; Migration; Races; Classification; Race Characteristics; Four Great Races; Geographical Distribution; Table of Ancient Human Remains; Table of European Peoples; Table of Asiatic Peoples. GEOLOGY: Departments or Phases; Agencies or Forces; Outlines. MINERALOGY: Relation to Geology; Classification of Minerals; Precious Stones. ORNITHOLOGY: Place in Natural History; Classification of Birds. PHYSIOLOGY AND HYGIENE: Cells; Muscular System; Osseous System; Nervous System; Sympathetic System; Foods; Circulatory System; Respiratory System; Excretory System; Reproductive System. HYGIENE: Cause of Sickness; How Disease Germs Are Scattered; Food as a Source of Infection; Disease Conveyed by Insects; Prevention of Disease; Disinfection; Purifying Water; Preventing Tuberculosis; Keeping Germs Out of the Body; Vaccination; Antitoxins; Pasteurized Milk; Mastication; PHYSICS: Electricity; Dynamo; Mechanics; Heat; Combustion; Light; Color; Sound. ZOOLOGY: Subdivisions; Table of Principal Groups of the Animal Kingdom; Protozoa; Metazoa; Mollusca; Anthropoda; Chordata. DICTIONARY OF ANIMALS. WEIGHTS AND MEASURES: Systems in General Use; English System; Metric System; Measures of Length, Capacity, Surface, and Weight; Measures of Time; Temperature Scales; Barometric Measurements; Weights and Measures of the Bible; Approximate Equivalents of Metric and English Systems; Force of Winds; Specific Gravity Table; Foreign Weights and Measures. . . . . 301

\* **General Bibliography of Science.**—Astronomy.—Campbell: *Handbook of Practical Astronomy*. Young: *Elementary Astronomy*. Manual of Astronomy, and General Astronomy. Hall: *Story of the Heavens*. Turner: *Modern Astronomy*. Newcomb: *Popular Astronomy*. Todd: *A New Astronomy*. Gregory: *Vault of Heaven*.

**Botany.**—See at close of section on Botany.

**Chemistry.**—Remsen: *Introduction to the Study of Chemistry and Inorganic Chemistry*. Rose: *Lessons in Elementary Chemistry*. Wurtz: *Elements of Modern Chemistry*. Ostwald: *Inorganic Chemistry*. Alexander Smith: *Laboratory Outline of General Chemistry and General Inorganic Chemistry*. Wiley: *Chemistry of Foods and Agricultural Chemistry*. Rose: *and Schorlemmer: Treatise on Chemistry*. Watts: *Dictionary of Chemistry*. Thorpe: *Industrial Chemistry*.

**Entomology.**—Comstock: *Insect Life*. Packard: *Text-Book of Entomology and Guide to Study of Insects*. Howard: *The Insect Book*.

**Ethnology.**—Prichard: *Researches Into the Physical History of Mankind*. Latham: *Natural History of the Varieties of Man*. Waitz: *Anthropology*. Darwin: *The Descent of Man*. Huxley: *Essays and Man's Place in Nature*. Quatrefages: *Classification des Races Humaines*. Peschel: *The Races of Man*. Tylor: *Anthropology*. Lubbock: *Prehistoric Times*. Bastard: *History of Mankind*. Kroeber: *Ethnology and Man, Past and Present*. Deniker: *The Races of Man*. Hutchinson: *The Living Races of Mankind*.

**Geology.**—Dawson: *Story of the Earth*. Lyell: *Principles of Geology*. Griekie: *Primer of Geology*. Sill: *Earth, Sea, and Land*. Scott: *Geology*. Griekie: *Text-Book of Geology*. Chamberlain and Salisbury: *Geology*. Le Conte: *Elements of Geology*. Dana: *Manual of Geology*.

**Mineralogy.**—Miers: *Mineralogy*. Dana: *Text-Book of Mineralogy and System of Mineralogy* (most comprehensive work in English). Brush and Penfield: *Determinative Mineralogy*. Rosenbusch-Iddings: *Rock-Making Minerals*. Hatch: *Petrology*. Butler: *Pocket Handbook of Minerals*.

**Ornithology.**—Newton: *Ornithology*. Huxley: *Howley: The Structure and Life of Birds*. Wilson: *American Ornithology*. Audubon: *Ornithological Biography*. Coues: *Key to North American Birds*. Chapman: *Handbook of Birds of East North America*. Bendire: *Life Histories of North American Birds*. **Physiology and Hygiene.**—Dayton: *Human Body and Health*. Martin: *Human Body*. Huxley and Youmans: *Elements of Physiology and Hygiene*.

**Physics.**—Ames: *General Physics*. Ames and Bliss: *Manual of Experiments*. Hoadley: *Measurements in Magnetism and*

*Electricity.* Preston: *Theory of Heat and Theory of Light*. Poynting and Thomson: *Heat*. Tyndal: *Light*. Schuster: *Theory of Optics*. Barker: *Phyica*. Merrill: *Theoretical Mechanics*. Helmholtz: *Sensations of Tone*. Kapp: *Electric Transmission of Energy*. Crocker: *Electric Lighting*. Sewell: *Elements of Electrical Engineering*. Jackson: *Elements of Electricity and Magnetism and Alternating Currents and Alternating Current Machinery*.

*Zoology*.—Rolliston: *Forms of Animal Life*. Huxley: *Anatomy of Invertebrate Animals and Anatomy of Vertebrate Animals*. Lankester: *Treatise on Zoology*. Parker and Howell: *Text-Book of Zoology*. Kingsley: *The Standard Natural History and Elements of Comparative Zoology*.

**Part V. Fine Arts and Religion.** FINE ARTS: Architecture; Sculpture; Painting; Music; Ceramics. SCHOOLS OF PAINTING; TABLE OF THE WORLD'S FAMOUS PAINTINGS; TABLE OF POTTERY, EARTHENWARE AND VASES; TABLE OF GLASS. RELIGIONS: Great Historic Religions; Religious Statistics; Religious Denominations in United States; Foundation, Doctrines, and Statistics of Denominational Bodies ..... 362

\* *General Bibliography*.—Religion.—Tiele: *Outlines of the History of Religion*. Clarke: *Ten Great Religions*. Hastings: *Dictionary of the Bible*. Adde and Arnold: *Catholic Dictionary*. Andrew Lang: *Myth, Ritual and Religion*. Müller: *Natural Religion*. Thompson: *Religious Sentiments of the Human Mind*. Tylor: *Primitive Culture*. Brenton: *Religion of Primitive Peoples*. Jordan: *Comparative Religion*.

Fine Arts.—Bryan: *Dictionary of Painters*. Grove: *Dictionary of Music and Musicians*. Sturgis: *Dictionary of Architecture*. Hughes: *The Musical Guide*. Frothingham: *History of*

*Sculpture*. Van Dyke: *Principles of Art and History of Painting*. Caffin: *How to Study Pictures*. Reinach: *The Story of Art Throughout the Ages*.

**Part VI. Government and Law.** GOVERNMENT OF THE UNITED STATES: Origin and Development; *Articles of Confederation*; *The Constitution*: The Federal Government—(1) Congress; (2) The Executive; (3) The Judiciary; (4) The States; (5) Territories and Dependencies. Presidential Elections and Inaugurations; Table of Presidents; Members of the United States Supreme Court; Speakers of Congress; Parliamentary Law; Table of Commercial Law; Table of Child Labor and Compulsory Education Laws ..... 378

\* *General Bibliography of Government and Law*.—Aristotle: *Politics*. Bluntschli: *Theory of the State*. Burgess: *Political Science and Comparative Constitutional Law*. Freeman: *Comparative Politics*. Goodnow: *Comparative Administrative Law*. Labor: *Cyclopedia of Political Science*. Lasker: *Treatises of Government*. Maine: *Popular Government*. Montesquieu: *Spirit of Laws*. Morley: *Ideal Commonwealths*. Plato: *Republic*. Rousseau: *The Social Contract*. Sidgwick: *Elements of Politics*. Spencer: *Man as the State*. Wilson: *The State*. Bryce: *The American Commonwealth*. Hart: *Actual Government*. Robinson: *Elements of American Jurisprudence*. Thompson: *English and American Encyclopaedia of Law*. Burdick: *The Essentials of Business Law*. Lowell: *Governments and Parties in Continental Europe*. Goodnow: *Comparative Administrative Law*. Dicey: *The Law of the Constitution*.

### BOOK THREE

## TRADE AND INDUSTRY

**Part I. Productive Industries.** AGRICULTURE: Oldest Form of Industry; Soils and Their Fertilization; Irrigation and Drainage; Tillage and Dry Farming; Status United States in Agriculture; Agricultural Education; Agricultural Colleges; Experiment Stations; Plant Breeding and Seeds; Horticulture; Animal Husbandry; Dairying; Veterinary Science. MANUFACTURES: Basic Industries; Materials of Manufactures; Power; Manufacturing Zones; Principal Centers; Exports; Manufacturing in United States Compared With Other Nations. MINES AND MINING: Fuels; Metals; Structural Materials; Chemical Materials; Miscellaneous Minerals. FISHERIES OF THE WORLD: Capture of Fishes; Salmon Fisheries; Lake Fisheries; Cod Fisheries; Deep Sea Fisheries; Fishing Nations; Artificial Hatchery. FORESTS: Lumbering; Forest Areas of Various Countries ..... 391

\* *General Bibliography*.—Clarke: *Art and Industry*. Koulion: *Economics of Manual Training*. Dapp: *The Industrial Element in Education*. Bailey and Miller: *Encyclopedia of American Horticulture*. Bailey: *Principles of Agriculture*. Wilcox and Smith: *Cyclopedia of Agriculture*. Miles: *Stock-Breeding*. Armsby: *Manual of Cattle Feeding*. Jordan: *The Feeding of Animals*. Wing: *Milk and Its Products*. Elliott: *Practical Farm Drainage*. Hunt: *Cereals in America*. Ure: *Dictionary of Arts, Manufactures and Mines*. Caulfield and Seward: *Dictionary of Needlework*.

**Part II. Business and Commerce.** Business Economics: Organization of Business Enterprises; Methods of Financing; Management; Distributive Industries; Wholesale and Retail Trade; Department Stores; The Foreign Market; Exporting; Importing; The Customs House; U. S. TARIFF LAW, TABULATED: Commercial Correspondence; Advertising; Salesmanship; Credit and Collections; Transportation by Land and Water; Corporation Economics. TABLE OF THE RAW MATERIALS OF COMMERCE: (1) Foods; (2) Beverages; (3) Spices; (4) Oils, Fats and Waxes; (5) Vegetable Fibers; (6) Woods; (7) Gums and Resins; (8) Dyestuffs; (9) Tanning Materials; (10) Animal Products; (11) Insect Products; (12) Mineral Products. Money, Banking and Finance: Functions of Money; Mediums of Exchange; Banks; Bank Notes; Exchange; Clearing House; Postal Savings Banks; Money Market; Panics; Foreign Financial Systems. Imports and Exports ..... 420

\* *General Bibliography*.—Ware: *Educational Foundations of Trade and Industry*. Webster: *General History of Commerce*. Mulhall: *Industries and Wealth of Nations*. Bolles: *Money, Banking and Finance*. Adams: *Commercial Geography*. Scott: *Money and Banking*. Walker: *Political Economy*. Carnegie: *Empire of Business*.

### BOOK FOUR

## UNIVERSAL GAZETTEER

**The Earth:** Form and Dimensions; Chemical Composition; Land and Water. **Oceans:** Antarctic; Arctic; Atlantic; Indian; Pacific; Islands; Marine Geography. **Continents:** Europe; Asia; Africa; North America; South America. **Countries of the World:** Abyssinia;

Argentine Republic; Austria-Hungary; Belgium; Bolivia; Brazil; British Empire; Bulgaria; Chili; China; Colombia; Costa Rica; Cuba; Denmark; Dominican Republic; Ecuador; France; German Empire; Greece; Guatemala; Hayti; Honduras; Italy; Japan; Liberia; Mexico; Monaco;



Montenegro; Morocco; Netherlands; Nicaragua; Norway; Panama; Paraguay; Persia; Peru; Portugal; Roumania; Russia; Salvador; Serbia; Siam; Spain; Sweden; Switzerland; Turkey; United States; Uruguay; Venezuela: Their Chief Dependencies: Tables of States and Territories: Table of Foreign Governments and Rulers; Table of the British Empire; Rivers, Lakes, Seas, Waterfalls; Moun-

tains and Volcanoes; Vegetable and Animal Life; Cities; Seaports; Climate and Productions; Table of World States; Census Statistics. LATITUDE AND LONGITUDE: UNITED STATES TRAVEL DISTANCES; CANADIAN TRAVEL DISTANCES; WORLD TRAVEL DISTANCES. . . . . 451

\* **General Bibliography.**—Blackie: *Imperial Gazetteer*. Longman: *Gazetteer of the World*. Lippincott: *Gazetteer*. Baedeker: *Guides*.

## BOOK FIVE

## ATLAS OF UNITED STATES

**List of Maps and Features:** Map of United States; MAPS OF THE VARIOUS STATES AND TERRITORIES: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island,

South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming. **INSULAR POSSESSIONS:** Hawaii, Philippines, Porto Rico, Panama Canal Zone. **CITIES AND ENVIRONMENT:** Chicago, New York, Philadelphia, Washington. **PANAMA CANAL ZONE; Important Railway Lines; Chief Commercial Centers; States Demarked Into Counties; Capitals and County Seats. . . . . 486**

\* **General Bibliography.**—Bartholomew: *Atlas*. Rand-McNally: *Atlas; Century Dictionary and Atlas*. Johnston: *Historical Atlas*. McClure: *Historical Church Atlas*.

## BOOK SIX

## DICTIONARY OF BIOGRAPHY

(Not in abridged edition)

**Literature:** Homer, Aeschylus, Sophocles, Herodotus, Demosthenes, Cicero, Vergil, Plutarch, Dante, Montaigne, Cervantes, Shakespeare, Milton, Moliere, Montesquieu, Voltaire, Lessing, Gibbon, Goethe, Schiller, Scott, Wordsworth, Balzac, Carlyle, Hugo, Emerson, Browning, Longfellow, Tolstoy, etc. **Fine Arts:** Phidias, Vinci, Michelangelo, Raphael, Titian, Rubens, Velasquez, Rembrandt, Bach, Handel, Mozart, Beethoven, Wagner, etc. **Religions:** Moses, Zoroaster, Confucius, Buddha, St. Paul, St. Augustine, Mohammed, Gregory VII., St. Francis, Luther, Loyola, Calvin, Wesley, etc. **Philosophy:** Socrates, Plato, Aristotle, St. Thomas Aquinas, Bacon, Descartes, Spinoza, Locke, Leibnitz, Hume, Kant, Hegel, Spencer, James, etc. **Science and Discovery:** Gutenberg, Columbus, Copernicus, Palissy, Galileo,

Kepler, Harvey, Newton, Linnaeus, Arkwright, Watt, Lavoisier, Cuvier, Stephenson, Morse, Darwin, Helmholtz, Kelvin, Edison, Bell, Marconi, Wright, etc. **Politics:** Alexander the Great, Julius Caesar, Charlemagne, Alfred the Great, Charles V., Grotius, Cromwell, Peter the Great, Franklin, Frederick the Great, Washington, Jefferson, Napoleon I., Webster, Lincoln, Bismarck, McKinley, Roosevelt, William II., Mutsuhito, etc. **Four Thousand Other Past and Present Leaders. . . . . 535**

\* **General Bibliography.**—Phillips: *Dictionary of Biographical Reference*. Vincent: *Dictionary of Biography*. Thomas: *Dictionary of Biography*. Appleton: *Dictionary of American Biography; Dictionary of National Biography; Who's Who in Great Britain; Who's Who in America*. Ruoff: *Masters of Achievement; American Statesmen Series; American Men of Letters; English Statesmen Series; English Men of Letters*. Smith: *Dictionary of Christian Biography*.

## BOOK SEVEN

## MULTIPLEX DICTIONARY

(Not in abridged edition)

**Special Features:** Concise Definitions of Carefully Selected English Words; Syllabication of Words; Pronunciation and Mispronunciation; Parts of Speech Indicated; Derivative Words Separately Defined; Synonyms and Antonyms; Proper Names Capitalized; Origin, Pronunciation, and Meaning of Geographical, Personal, and

Curious Names; Cognates in Other Languages of Personal Names. . . . . 685

\* **General Bibliography.**—Webster: *New International Dictionary*. Worcester: *Dictionary of the English Language*. Funk and Wagnall: *Standard Dictionary*. Whitney: *The Century Dictionary*. Murray: *Oxford English Dictionary*. Wright: *Dialect Dictionary*.

## LIST OF ILLUSTRATIONS

## Text Illustrations

MORNING IN THE KINDERGARTEN—THE TALK AND STORIES.

PLAY CIRCLE IN THE KINDERGARTEN.

CHILDREN'S INDUSTRIAL WORK.

CHILDREN'S PLASTIC WORK.

KINDERGARTEN PLAY-GROUND.

AGRICULTURAL, ARITHMETICAL, CHEMICAL, MUSICAL, AND INDUSTRIAL GRAPHIC CHARTS.

## Sepia Plates

COMPARATIVE GEOGRAPHY OF THE WESTERN HEMISPHERE:  
Mountains; rivers; lakes; islands; waterfalls.COMPARATIVE GEOGRAPHY OF THE EASTERN HEMISPHERE:  
Mountains; rivers; lakes; islands; waterfalls.

## PLANT LIFE I.:

Cotton, fruit and seed; Linden, flower and seed; Tamarix, flower section; Morning Glory, flower section, fruit and seed; Willow, flowers and seed; Juniper-pine, leaves, cone, and scale; Magnolia, flower section; Field Horsetail, plant form; Arisaema, stem, leaf and flower; Thistle, flowers and bracts; Flax, fruit and seed; Monarda, flower section; Poppy, flower section; Birch, flowers; Melon, flower section; Buttercup, section of flower, pistil, stamens, ovary, etc.

## PLANT LIFE II.:

Composites; Gagea, flower; Maple; Clove, flower section and fruit; Laminum, flower side and front; Streptanthus, flower section; Pepper, flower and fruit; Onocleas, flower section; Aralia, flowers; Cornus, flower; Clover Beech; Sage, flower and section; Oak; Peach, flower section; Saxifrage; Ash, spiralella flower; Grape, closed, opening and opened flower; Gentian, flower section; Chickadee, flower and fruit; Carnot, flower and fruit; Alfalfa.

## KINDERGARTEN GIFTS I.:

First gift, conveying the ideas of motion and matter.  
Second gift, matter and measurement.  
Third gift, length, breadth and thickness.  
Fourth gift, beauty forms.

## KINDERGARTEN GIFTS II.:

Fifth gift, conveying the ideas of dimension and form.  
Sixth gift, surface, line, and point.  
Seventh gift, contour by use of sand.

## AIR-CRAFT:

Farman's Monoplane; Maxim's Flying Machine; Montgolfier's Balloon; Santos-Dumont's Balloon; Zeppelin's Airship; Latham's Machine; Maxim's Model; Wright Aeroplane; The Farman Machine; Dapuy de Lemaire's

Airship; Parachute; Airship of Renard and Krebs; Wolfert's Airship; Chanute's Flying Apparatus; Glenn Curtiss' Machine; Langley's Flying Machine; Paulhan's Machine; Stanley Spencer's Balloon.

## THE HEAVENS:

Photograph of the Sun; The Moon, photographed at Lark Observatory; Star Nebula, Milky Way; Typical Sunspot; A Comet; Craters of the Moon. Highly Magnified.

## Color Plates

(Not all included in abridged editions)

## RACES OF MEN:

Akka (Fazm); Darfur Negro; Swahili (Hantu); Bechuana Girl; Bushman Woman; South Australian; Fujian (Malanesian); Pai Ute; Botocudo (South America); Fuegian (South America); Apache; Mongolian; Chinese; Gilyak; Korean; Japanese Woman; Sumatran Woman (Malay); Ratta of Sumatra ("Indonesian"); Eskimo; Caucasian; Samoan (Polynesian); Fellaah (Hamitic).

## FLOWERS, FUNGI AND GRASSES:

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## MARINE LIFE:

Jelly-Fish; Cat-Shark; Tube Worm; Root of Jelly-Fish; Umbrella of Jelly-Fish; Crinoid; Squid; Sting-Ray Shark; Giant Perch; Lobster; Red Crab; Star-Fish; Mollusk; Sponge; Coral; Hermit Crab; Sea Anemones; Yellow Coral; Tube Worms; Sea Roses; Crabs; Cuttlefish; Sea-Trilobes; Horse Sea-Rose; Sea-Hare; Scallops; Nail Sea-Hare; Weaver; Sea-Cucumber; Skate.

## OBJECTS AND DESIGNS FOR PRIMARY WORK.

## ANATOMICAL PLATE:

Heart; Auricles of the Heart; Pulmonary Circulation; Portal Vein Circulation; Circulation of the Blood in the Body.

## DOMESTIC ANIMALS:

Hampshire Pig; Narragansett Turkeys; Poland Cock; Yellow China Fowls; English Thoroughbred; English Goose; Toulouse Goose; Plymouth Rock; Herd of Cattle; English Bantams; Southdowns; White Plymouth Rocks; Barred Plymouth Rock; Shetland Pony; Gold Bantam; Belgium Horse.

## WILD ANIMALS:

Gorilla; Ruffed Lemur; Vampire; Walrus; Cohago; Reindeer; Strout; Pea Weevil; Polar Bear; Squirrel; Hare; Anteater; Badger; Beetle; Indian Elephant; Aye-aye; Lemming; Wildcat; Dormouse; Tiger; Hedgehog; Marmoset; Armadillo; Lizard; Apple Weevil; Peewee; Hyrax or Damian; Snake; Lion.

## PAINTING:

Mrs. Siddons—Gainsborough; Mona Lisa—Vinci; Madonna del Grazi Dura—Raphael; Study of the Cloth Merchant's Guild—Rembrandt; Portrait of My Mother—Whistler; The Schoolmistress—Fragonard.



MOTHER AND CHILD—*Reynolds*  
BRITISH SCHOOL



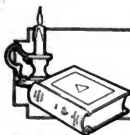
"BABY STUART"—*Van Dyck*  
FLEMISH SCHOOL



DON BALTHASOR CARLOS—*Velasquez*  
SPANISH SCHOOL



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CARNATION LILY, LILY ROSE—*Sargent*  
AMERICAN SCHOOL



# FIELD OF EDUCATION



## THE END AND AIM OF EDUCATION.—

If the 15,000,000 children of school age in this country were placed in a solid line, it would extend from the northeast coast of Maine to the southwest coast of California, and according to Professor Snyder, all except those that stood in the latter state do not go beyond the grammar-grades. Worse than that, the majority of our citizens and voters have probably not gone much, if any, beyond the end of the sixth grade. Thus the problem of doing the most and best for the grammar-school children is one of profound national importance for the safety and welfare of our country.

The end and aim of education is to develop each individual to the most complete maturity of all the powers of the body and mind. In its larger sense, education begins at birth, or with the marriage of the parents, and we must not forget, that, besides the school, there are more than fourscore different types of child-welfare organizations that are essentially educational, dealing with health, morals, recreation, occupation, religion and all the rest.

An educational system naturally falls into four grand divisions: The first deals with the child up to the dawn of the teens; the second, or intermediate or high school, includes the early and the third, or collegiate, the later pubescent years; the fourth, or professional, deals with mature young men and women.

**Primary Education.**—The end and aim of primary education may be divided into (a) special, and (b) general. Under the first come reading and writing. The child who has mastered these arts has access to all the literature in the vernacular. He can transcend his own limits of time and space, and commune with the greatest minds that have left their written records and literature in any age or land. He can become a world citizen and learn from the printed page whatever he will about the life of his own community, state, nation, the world; and from this point on, in some sense, his education is in his own hands.

The point now to be stressed is how to insure that he will read the best, and not the worst, things in print. He has before him the world of letters and books. There is, alas, always the possibility that he will be degraded by reading what is vile and demoralizing, for there is printed matter which anti-vivisection societies destroy by the ton, which causes a moral decay that is impossible to those who cannot read. A graver danger, because one to which all are exposed, is that of spending their reading time upon the second or tenth best, for print now keeps alive masses of material which would have sunk to oblivion but for the printer's art.

**Good Books.**—Among the most precious educational agencies are those that determine the content of school readers, advise and list the best books and incite children to read them by means of story telling and libraries in the schoolrooms and arouse and direct the reading habit, which at about the end of the grammar grades

reaches the highest point of its curve. At this age, more boys, and especially girls, are liable to have reading grades than at any other. Hence some have gone so far as to advocate a kind of school Bible or canon so as to make certain that children shall know and feel the uplift of the greatest books that make the world's classic literature, in some epitomized form. By the aid of the story teller's art this ideal is no longer impossible. From the spontaneous reading interest of children, of which there are now several admirable special studies, it would appear that on leaving the grammar grades, each child should have some special reading interest and have acquired the habit of gratifying it in our now universally diffused libraries, to which most children have access.

**Arithmetic** is the door to mathematics. Although we have doubtless overemphasized it, it is essential that the child command the methods of ready and correct computation which are vital for every vocation. The simple rules of arithmetic and fractions, the laws and tables of mensuration, proportion, the elements of the roots and powers of numbers, with the elements of geometry, but not much of any algebra, should be attained. Fair penmanship and simple composition, with decent command of the English language, are of course essential. The movement to defer writing till the second grade, or the eighth year, is beneficent, and will do much to improve penmanship, while more oral and less written work will tend to give a better command of language, which lives, moves and has its being in the circuit from ear to mouth, and in a dead and lifeless thing on the long circuit from the eye that reads to the hand that writes.

**Nature Study**, a little school gardening and occupational work, rote singing, which should precede note reading by several years and which cultivates not only the voice but the heart, is now believed to be both possible and desirable for nearly all children.

**Geography** should begin with the knowledge of the immediate environment perhaps of the schoolroom and widen to the town, the state, the nation and the world, in concentric irradiation, with some map drawing and sand modeling, with industrial, commercial and transportation elements always stressed. This work can often be naturally connected with the industries of the locality, sources of raw material, markets for the finished products, and be helped out by regular school visitations to the principal industries of the town.

**History and Civics** are vital for citizenship. Both may well begin with the locality, with visits to the city hall and other, public institutions of knowledge, the historical monuments and their significance, and sentiments inspired by the flag.

Besides these, there should be a margin or fringe of accessory influences pervading the grammar grades. Arbor Day and other holidays should always bring their lessons. There should be, if possible, visits to the reformatory and charitable

institutions of the vicinity, and their lessons should be inculcated. Before leaving the grades, every child should have a good repertory of plays and games, and should have some practice in the elements of manual training as introductory to some form of skilled labor. The influence of the school house, room and yard should be made the best possible, and the personal influence of the teacher should culminate in occasional serious and carefully prepared talks upon life and its duties, obligations, social relationships.

At the very beginning of the teens, teachers and systems should recognize the marvelous expansion of energy and the new interests that are awakened and therefore the new methods that are necessary to enlist the best powers of the child.

**Intermediate Schools.**—Every community should have continuation schools to meet the needs of the thousands of children from thirteen or fourteen to sixteen who have left school and who cannot and perhaps should not find vocational employment. The needs of this class of children are now a great problem, and there is a growing consensus that industrial occupations should be provided for all who want them.

**Moral Instruction.**—In this critical period of life, habits that will endure are being formed more rapidly than any other. Morals need great attention. There is now a new awakening of the community to the dangers of sex errors, and the need especially for boys, if not also for girls, of some definite and personal instruction along these lines. It is when we consider this aspect of the subject that we realize most keenly the need of more male teachers, especially for boys who in these years experience, consciously or unconsciously, something of revolt against exclusively feminine control whether in the home or the school. Every boy needs a personal mentor such as the Big Brother movement contemplates. He also ought to be looked over by a vocation bureau and given hints at least concerning classes of occupations which he should avoid and those which he can hope to enter with some advantage.

**A Sound Body.**—Every school child should throughout this period have stated and repeated medical examination. The teeth at most always need attention and irremediable injury may follow if it is wanting. Ears and especially eyes should also be tested. The general condition of each child should be inspected and suggestions to parents and teachers made. In some lands a life and health book is kept, recording the observations of teachers, and the suggestions of physicians concerning regimen, diet, etc. Recent studies by the scores of hundreds show how many children are handicapped for life by defects that could be remedied and diseases that could be avoided. To this end, gymnastics, playgrounds, open-air schools, excursions, school meals, dietaries, free dispensaries and all the other health-giving agencies are now greatly desired.

**Secondary Education** proper has two ends: (1) to fit for higher institutions, and (2) to fit for life. These two ends are disparate, and should never be confused in the present stage of our educational development. There must be fitting schools, but on a liberal allowance, less than ten per cent of those who enter the high schools will complete college courses. Hence the high school ought to be the people's college, where the work of the grammar grades can be reviewed and much enlarged. At present, vast numbers who enter the high school leave it before the completion of the course, especially at the end of the first year. The high school is the most conservative of all our educational institutions. It is prone to ape the college in its spirit and methods. The ideal should be to fit the boy and maiden for the higher vocations of life. Chief stress should be laid upon the vast resources of the *English language and literature*. The reading habit should be conserved and made very extensive, and less intensive than at present. *History* should come down to the present time and discuss vital problems and questions that are now interesting men and women. There should be always an opportunity for modern languages, which, when taken, should be taught intensively, and with a view both to conversation and to some acquaintance with the masterpieces in each. Science should be stressed, especially in its applications which normally precede interest in pure science. Lessons should be taught descriptively and experimentally with far less stress than is now customary upon mathematical formulas, with plenty of the rich historical and biographical material in which it abounds. The story of modern science to the high-school boy and girl is normally a great romance, and scientific kites, aerial navigation, motors, the telegraph and the telephone, wireless telegraphy and the rest should have their place as great generators of scientific interest. There should be abundance of apparatus and charts and diagrams galore. A high school without these is almost a body without a soul. *Biology* should be taught, not first by the technique of the microscope, but from an economic standpoint. Pests, vermin, the life histories and instincts of the great groups of animals, beginning with those with which the pupil is more familiar, should be made the center; and technical terms, while necessary, should not be overemphasized or made too abundant. The mysteries of life, health, reproduction, and disease lie in this field and should be made the most of. Physiology should anchor in regimen and give a wholesome and intelligent interest in body keeping, regimen, exercise, etc., and should not omit temperance, the sex function, and other practical applications of its profounder principles. Citizenship here, too, should be emphasized. Individual duties to parents, teachers, fellow beings, to the city, state and society at large should be brought out in a large, general and comprehensive way. Specialization should be favored only in case of those who have pronounced tastes and attitudes in specific directions, and be, as a rule, more and earlier and far easier with boys than with girls. The latter should not only have opportunity to prepare for wage-earning occupations like stenography, typewriting, bookkeeping, dressmaking, millinery and the rest, but should have both opportunity and incentive for acquiring interest and facility

in domestic occupations. They should be taught the meaning of home industries and of domesticity, should have opportunities to learn the elements of marketing, cooking and personal and household hygiene. We have forgotten the educational value of the practical, which is in fact far greater than that of the purely theoretical. Utilities, therefore, in the high school should have a larger place than is now generally accorded them as compared to the abstract and scientific.

**Industrial Training** for the high-school grades should not be chiefly manual training, but more specifically vocational. The stated sloyd, wood and iron work that makes objects of little use makes little appeal, and the manual-training high school of the old type now seems likely to fade as compared to the more definite industrial courses which are already made possible in so many centers and which are likely to greatly increase in the next few years. The high-school graduate who does not go on should not be too proud to begin at the bottom of the industrial ladder and to acquire the educational advantages to help him advance up its rungs more rapidly than he would otherwise do. The first duty of the school under the new dispensation of education that now seems to impend is to teach at least every boy to be self-supporting, for only on this basis can he make a good citizen and develop further amenities and cultures. He must be able to do something that really earns wages, for this is one of the most quickening of all intellectual spurts.

The same is true to some extent for girls. **Collegiate Education.**—It is hard in the present confused state of competent opinion concerning collegiate education to define its aim with positiveness. We have here two ideals, and, indeed, two types of institution. In one, the theory of general culture predominates. The college graduate must be mature, intelligent, gentlemanly, must learn to know the resources of a vast variety of special cultures and to choose intelligently between them later. He must be humanist and scientist, idealist and realist; he must study the world, although at a distance and from the printed page, must accumulate wisdom that can be applied later, must push on in mathematics because this is now the language of all the exact sciences. He must know Latin if he is to be a biologist, physician, lawyer or clergyman, and Greek can do him no harm. He must be able to grasp the content of any book in at least French and German, and know something of the great movements of the world represented in these literatures. He must have a general knowledge of the history of the world in its different countries. In this field, a new demand is now laid upon the teacher of history. It is not enough to know the past, but with the opening of the Near and the Far East and with the widening of our own national interest to cosmic dimensions, one must know the great problems of present-day administration and policy; the present situation in China, Japan, Young Turkey, Persia, the Congo and Africa, and South America must make each a center of vital interests, so that when he leaves academic halls he will not only find himself abreast of the great interests now pending in these fields, but will have a deep wellspring of interest for them kindled in his own heart which will enable him to be a respectable citizen of the world as well as of his

own land. He must get in vital rapport with the great social, economic, charitable, and religious movements of the day, must know something of the leaders and of the arguments of both sides. Never was a present so absorbing; never were the questions of the great world so important for every part and member of it as now. Much might be said in favor of studying history backward at this stage of education, for it is just as logical to proceed from effect to cause as *vice versa*. Indeed, antiquity, full of interest as its departments are to the specialist, and rapid as is the progress made in unearthing the earliest stages of mankind's development, seems somewhat palling in interest before the multiplicity of new and pressing present issues. There is danger that the college graduate-to-day will be confused by the multiplicity of electives, and perhaps overwhelmed by a sense not of how much, but of how little, he knows, for with true education the latter grows more rapidly than the former; hence the necessity that the college teacher should be a man of wide learning and devoted to the development of general ability and information on the part of his students, rather than a too sharply trained specialist.

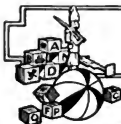
The other collegiate ideal is practical and vocational. Thousands of young men to-day in this stage of their preparation have decided upon their field of work, and are seeking the bachelor's degree in order to make themselves more proficient in it. If they contemplate the law, they study history and economics with special reference to the demands of that profession. If they intend medicine, biology and chemistry; and if the ministry, sociology and perhaps even church history and Greek and Hebrew are taken for the professional aids that accrue therefrom; if technology, the sciences it requires are stressed. These students are more alert, active, interesting, for they have really entered upon the fourth of general education.

**Professional Education.**—Here we have, first, the university that is devoted to the training of experts along specific lines. Its goal is not only to make men, but to add to the sum of human knowledge. Every doctor of philosophy preparing his thesis, desires to bring some brick, however tiny, to be built into the great temple of science, which is the sublimest creation of man. He wishes to be an authority in some field, however small, and not an echo. It is amazing to contemplate how many of the epoch-making discoveries of recent decades have been due to the splendid co-operation of young men, with their enthusiasm and energy, working with and under the direction of leading and inspiring professors. The development of education in this field since the epoch-making establishment of the Johns Hopkins University in 1876 has been one of the brightest chapters in our educational history. When we come to professional schools, we find that medical education has been vastly extended, and its methods improved, especially in the direction of the discovery of the causes of various infectious bacterial diseases by the methods of immunity and therapeutics. The clinical hospital work has greatly increased, and another great extension in this seems to impend in the direction of the understanding and better control of neuroses, and especially of psychoses, which just at present have not yet an adequate representation. In legal education, the case method has brought the greatest

reformation, and has made the study of law more concrete and definite. Here, too, as everywhere else, specialization is rapidly increasing because the domain has extended far beyond the capacities of any individual mind. In technology, too, great progress has been made in methods and matter. Courses have been enriched and condensed, and our schools

now turn out engineers that in many respects lead the world.

Theology, unfortunately, lags behind. It has, to be sure, been greatly quickened by new sociological studies and practical work, but it needs great extension, and more attention should be paid to psychology, or to the nature and genesis of the soul which the clergyman seeks to save.



## KINDERGARTEN

### AN EXPLANATION OF THE KINDERGARTEN FOR MOTHERS AND TEACHERS

**Origin.**—The first kindergarten was established by Friedrich Froebel, at Blankenburg, Germany, in the year 1837. The name *kindergarten* ("the garden of children") indicates the new psychological view upon which is built the system of education that has grown out of the kindergarten.

Believing that man and nature were both created by the same divine Being, Froebel felt that they must be governed by the same laws. He reasoned, that as the farmer puts nothing new into the seeds which he plants, but merely gives them the right kind of soil and the right care, keeping the weeds from choking them, giving them a sufficient amount of water and room in which to grow, putting poles or props for the tendrils of climbing plants to cling to, and loosening the roots to give more air and freedom for the growth of the plant; so, too, the parent or teacher could add nothing new to the child. He or she would merely superintend the unfolding of the child's inborn powers, and supply the suitable employment of those powers, so that they, by being rightly exercised, would grow as they were intended to grow by their Creator.

This now seems a self-evident proposition to the thoughtful person. But at the time of the founding of the kindergarten, information was considered as the one all-important thing in education, and the more information crammed into a child the better. This old and most erroneous view is now being superseded by the system of education which gradually grew out of the "kindergarten idea," so called, but which more properly should be called "the new psychological idea of education."

It has already been stated, that as all the plant was ever to grow into was already in the plant, so, too, all of the child's real self was already in the child.

**Mother's Chief Work.**—Therefore the intuitions were the true basis of education, and the understanding of what these intuitions are, and how to supply what they need, to strengthen them and make them develop aright, is the chief work of the parent as well as of the teacher. To say

that this revolutionizing the idea of "education" is making a mild statement of the changes which are taking place in the schoolroom and in the home management of children.

Pestalozzi, the Swiss reformer, from whom Froebel learned much, had already said that the inborn powers of the child were to be developed by exercising them. But Froebel, gifted with far deeper insight, insisted, that, as all the child's growth came from within, it must be *voluntary*. His deeply religious nature led him to see, that, as God was a Creator, and had created the universe out of His own inner Self, so man, made in the image of God, must learn to put forth his inner-self and to use his inborn powers, not mechanically, nor because such and such a thing was prescribed by some one in authority, but of his own free will, that is, creatively.

#### How the Child's Inner Nature Grows.

—It can thus clearly be seen that the basis of the kindergarten is distinctively religious, though in no sense of the word denominational. This deep religious view of the inner nature of man, as the "child of God" is to be found in all of Froebel's writings. (See *Education of Man, Pedagogics of the Kindergarten, Education of Development*, etc.) In fact, his writings cannot be rightly used unless it is realized that he is thinking of the inner-self of the child rather than of his physical body. Even when he is giving instructions as to how a child's body shall be exercised, it is in order that the body may become the better instrument by means of which this inner-self may express itself.

Perhaps this fundamental basic idea of the kindergarten may be more clearly understood if the same thought is expressed in psychological terms, as *Psychology* means the science of the soul, and deals with the law by which the soul (the spirit, or inner-self) grows.

A simple statement of this profound science is that "the child is a self-creating being." The process of self-creating is as distinct a process as is the law which governs the growth of the plants. Plants,

animals, and men, all created life, develop from within. The difference between the life of plants and animals and the life of man is that life in the former is unconscious life, and, therefore, governed by a law from without, whereas man life is a conscious life and is, therefore, governed by a law from within. *This conscious life is man's inner-self.* The process of self-development, or self-creating, is that this inner-self can separate itself from itself and yet recognise itself thus separated as self.

We are all of us dimly conscious of the process going on within us when "our higher self" reproves "our lower self," and we say "I was ashamed of myself," or "I said to myself, that's wrong," or, again, when a man's self-respect outweighs every temptation. One of Emerson's most famous sayings is, "Unless a man hath a will within him, you can tie him to nothing"; that is, unless the inner-self can control the inner-self no outward obligation is binding.

**What Play Means.**—This psychological insight showed Froebel to be one of the prophets or forerunners of the new world discipline, *psychology*, which is so rapidly changing not only our views of the nature of man and our method of education, but also our treatment of criminals, and our solution of many of the problems that have vexed the ages. Froebel shared this view of the nature of man with the leading minds of his age, but to him belonged the honor of first practically applying it to the training of young children. He insisted that *play*, or *voluntary* effort, was the most important activity of childhood; that in play the young child was uttering, or uttering his inner-self, and that therefore it was a *spiritual activity* inasmuch as it developed the child's consciousness of his inner-self, and of his power to express, or outer that self, and that this inner-self was what was meant by the Scriptures as "the image of God."

He urged always that the development of the consciousness of the self-making power of this divine inner-self was the end and aim of all education, inasmuch as it drew man near to God, and helped him to comprehend how all men were brothers, as they all have this inner-self, or "God-image" in them, with its limitless power of unfolding.

**The Right Kind of Play-Materials.**—This view of education caused him to search earnestly and thoughtfully, through long years of self-sacrifice and poverty, for the right kind of play and the right kind of materials with which to engage children's instinctive activity, for he saw that idle play and haphazard activities were not the truest and best means of educating and developing this inner-self or divine element in man; and yet he knew that the plays and the activities of childhood must

be simple and happy ones. It was his organization of the right kind of games and his creations of the tools of the kindergarten that constituted his most important work and showed him to be a genius—probably the greatest in the educational world.

**General Outline of the Play and Work of the Kindergarten.**—For the sake of more definite explanation of the activities that take place in a good kindergarten, the morning program may be considered under three general heads:

1st—*The Play-Songs*, or morning circle.

2d—*The Play-Gifts*, or table-work.

3d—*The Play-Ring*, or the games.

objects brought in by different children.

Under the same general head may be classed the excursions which a child and his mother, a single group, or sometimes the entire kindergarten may take to nearby places of interest where beautiful aspects of nature may be seen, or where some form of the work of mankind is going on, and the out-of-doors gardens of the children, and their play in out-of-doors sand pile.

Each of these activities has its own distinctive educational value, both in the home and in the kindergarten. But the materials used and the activities engaged

value have grown many of the improved methods now seen in our best schools.

**Value of Morning Talks.**—The morning talks in the kindergarten in which the children are encouraged to tell of their individual experience or to express in their own way their ideas concerning this or that object, picture, story, song, or other topic introduced by the kindergartner or some other child, are valuable because each child thereby gains fluency in self-expression through words. It has done much toward the advancement of the psychological methods of teaching reading and writing.

The words in printed books are no longer



MORNING IN A KINDERGARTEN—THE TALK AND STORIES

The first, the morning circle, varies considerably according to the needs of the hour and the interests of the children. Its chief purpose is to unify the group of children by bringing them into a common interest, or exercise. It includes conversations in which a child and his mother or a group of kindergarten children tell of their individual experiences, or listen to the experiences of other children, or of the kindergartner, the learning and singing of songs, the listening to wisely selected stories, the looking at and talking about pictures, also the examination of

in are less organized and more easily understood than are the *gifts* and *occupations* (or the table-work), or than are the kindergarten games.

Froebel's *Mother-Play Songs* and the explanations which accompany them, give a general idea of the various activities referred to in this first group and of their significance, although a mother in her home life with her children can do much that will be of great value if she has grasped the purpose of the above mentioned activities.

Out of a realization of their educative

drilled into the memory of first or second grade children, but reading and writing are made a means of self-expression on the part of each child and of getting the self-expression of the other members of his class. This has produced the method of introducing many short sentences written on the blackboard by the teacher. "Little stories," the children call them.

They are accounts of some experience that they have had in common, the sentences being composed by the children and written by the teacher, or short notes and letters written by the children and read by the



teacher, and various other exercises in which the difficult task of mastering the arbitrary signs (the printed words) is accomplished by an effort of the child's own inner-self to express itself by means of words.

**Value of Stories.**—Not only does the child grow accustomed to expressing himself in good, simple language in these conversations, but the earnest mother as well as the skilled kindergarten, knowing the power of the ideal to stir the emotions and arouse the imagination, uses these opportunities also for the telling of stories such as will quicken the right effort. Most of the kindergarten stories are symbolic rather than historical or informational, as the symbolic story contains an underlying truth, not expressed nor emphasized,

the Bible as Dean Hodges has told them can be told the five-year-old with profit and pleasure. The stories of the kindergarten by means of which the childish sympathy and imagination are quickened were the fore-runners of the "story hour" in the school-room, and, better still, of "the story-tellers' league," an after-school or holiday occupation in which first one child and then another tells a story, thus learning to express himself through the avenue of literature as well as to enjoy literature as an expression of the inner-life of others.

**The Value of Music.**—The joyous atmosphere of music and song, with which the kindergarten is flooded, has caused the thoughtful educators of older children to realize what an enormous instrument good music

developed into the recognized need of school gardens to such an extent that the agricultural departments of national governments are now giving generous aid to the establishment of the same. These modern developments in the educational world are spoken of here merely to make more clear the nature and value of the kindergarten activities, when understood and continued in more detailed form in the child's later school life, or in the home life, and they must not be taken as boastful and foolish assertions of the superiority of one stage or phase of education over another. They all belong to the new psychological era of education which realizes that the child must educate himself.



PLAY CIRCLE IN KINDERGARTEN

but merely embodied in the poetic form suitable to a child's stage of development, such as *Norse Stories*, by Hamilton Mabie; *The Wonder Book*, by Hawthorne; many of Grimm's *Fairy Tales* and the like. Almost all large publishing houses now have lists of stories of this kind.

Incidental stories are, of course, occasionally introduced. But the development of the child's powers of feeling, willing and thinking can best be aided by the presentation of ideals in the art form that the symbols of literature have furnished from time immemorial. This is what is here meant by "the poetic form" of literature.

Homer's *Odyssey* can be given quite early to a child. And the great hero-stories of

is for the development of and the giving expression to the right emotion of children of all ages. There are now many simple but good song books for children that any kindergarten supply store can furnish.

**The Value of Gardens.**—Gardens small enough and simple enough to be cared for by the children themselves are an essential part of the kindergarten system. Oftentimes this is only a few pots of plants or a small window box in which the children plant a few hardy, easily grown seeds, so that they may watch the mysterious growth of the same and thus begin to feel man's power to help or hinder the growth of nature. This care of a few plants has

#### The "Gifts" or Play-Things of the Kindergarten.

—The most distinctive and original part of Froebel's work was the creation of the *Gifts* and *Occupations*, or the *play-things* and *play-materials* of the kindergarten. They are almost limitless in their creative possibilities, and are closely allied to the more essential activities of mankind; and yet they are so simple that a child of three or four years of age can use them creatively. (See *Pedagogics of the Kindergarten and Reminiscences of Froebel* by Baroness von Balow.)

Comenius, the first of the modern educational reformers, made the astounding discovery that children learn more readily and more rapidly from objects than



from words; and for the first time in the history of the world, the insatiable "touch-hunger" of childhood was gratified by object lessons.

Pestalozzi, the great forerunner of Froebel, accepted the fact that self-development began with sensation; that is, he saw the value of letting a child see, hear, touch, smell or taste the things about him. And he added another important thing toward the right understanding of children, namely, he interpreted the ceaseless activity of children aright, as the indication of inner power, and realized that this activity could be used for their education instead of being rebuked and repressed. These two discoveries made a tremendous ad-

but tremendous work of developing the inner life of the child, that immortal part in which the divine Creator manifests the infinite power of his "image" in man.

**Why Froebel Organized Play-Things for the Child.**—But Froebel also realized that the myriads of sensations of motion, form, size, color, texture, weight, light, heat and the like, which poured ceaselessly in upon the mind of the child from the outside world, were too many and too complex to be grasped and assimilated. He realized, also, that the young child left unguided is as apt to attend to trivial or confusing sensations as he is to attend to fundamental and helpful ones.

full significance, he created and selected the playthings or play-tools of the kindergarten, which are so simple yet at the same time so suggestive that had he done nothing else they would entitle him to be recognized as a creative genius.

His selection of some and creation of other of these play-tools was based on the psychological explanations of God, Nature and Man. Briefly stated, his "World View" was this: he believed God to be the one Creator of all forces and phenomena of the universe, and he interpreted nature to be the uttering or utterance of God. The great divine Creator *in order to be Creator* must create or utter himself; in other words, that the divine Spirit must



KINDERGARTEN PLAYGROUND

vance in educational methods as well as in the better treatment of children in the home.

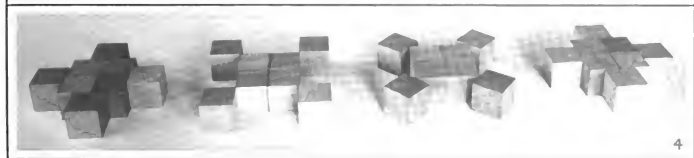
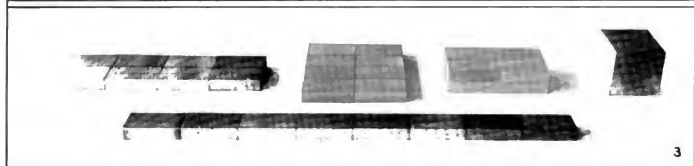
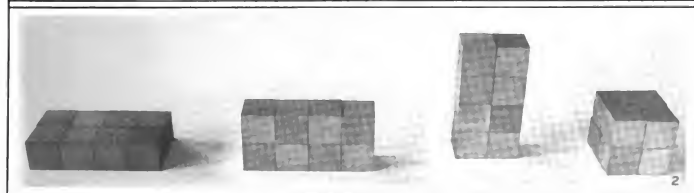
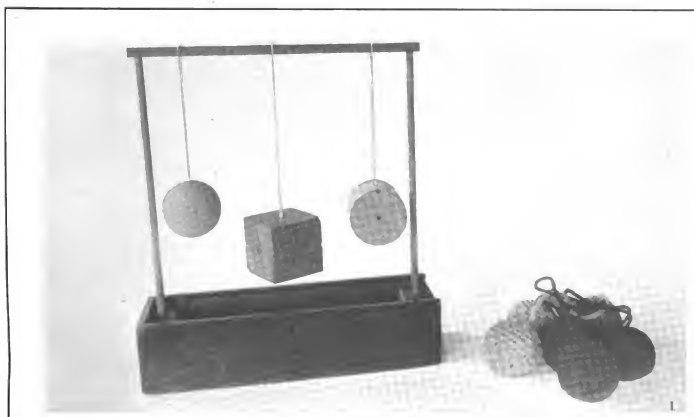
But Froebel's insight was far deeper and more fundamental than that of either Comenius or Pestalozzi. He realized the truth which has been accepted by most of the psychologists since his day, namely, that nature was the great awakener of the *inner life* of man; that through the senses came the summons from the outside world to the soul within to awaken and begin its effort to express itself. He realized that sense-perception was the stimulant which began not merely "the motor-reaction of the different nerves" but that through sensations, feeling, willing and thinking also began their subtle

As mere information is a secondary thing, the all-important work for the mother and kindergartner is to stir the right emotions, and then see to it that the voluntary effort awakened by the right quickening of feeling is genuinely put forth and, if possible, is brought to a successful result, as failure after genuine effort is hard to bear and often creates a discouragement which is injurious. This is one of the reasons why the work attempted, even the creative work voluntarily attempted, and the means employed should be simple and within the possibilities of the child's power to master.

With an intellectual grasp so great that the world has not yet realized its

manifest itself in an objective world. This objective world was nature. But to truly and fully manifest or outer himself, God must also create a creative being who could in his turn recreate and thus become the "image of God." This creative creature was MAN

In the kindergarten, therefore, emphasis is placed upon the child's doing original, creative work rather than upon copying the work of some one else. The all-important educational value is not that things shall be made, but that the children in making things shall learn the *process of making*. The thoughtful and earnest mother or teacher who takes time to really study Froebel's *Kindergarten*



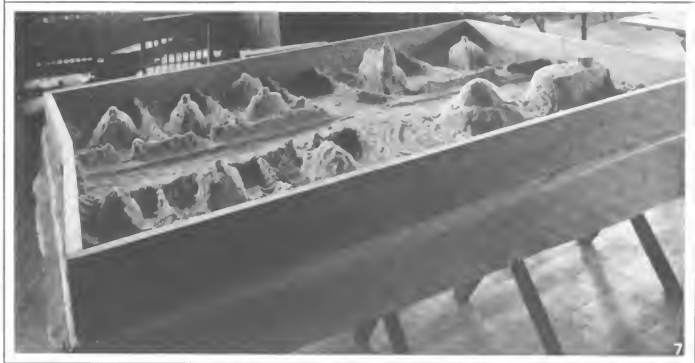
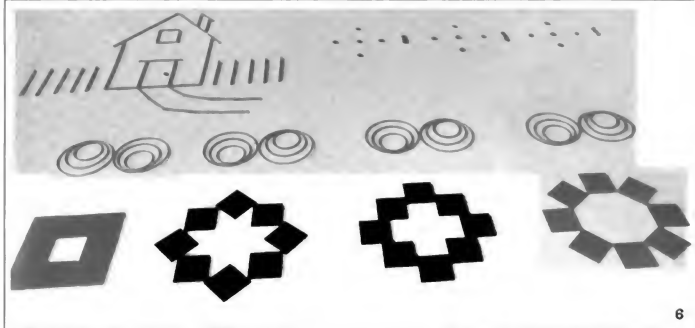
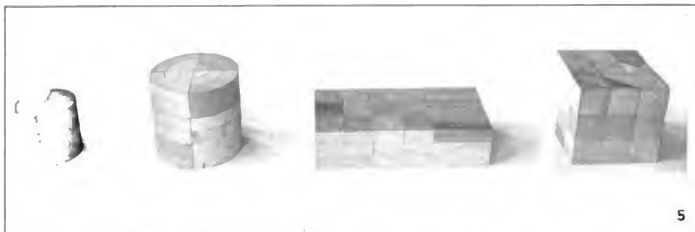
# KINDERGARTEN "GIFTS." PLATE I

1. Gift first, conveys ideas of motion and matter.

2. Gift two, matter and measurement.

3. Gift three, length, breadth and thickness.

4. Gift four, figure-forms.



KINDERGARTEN "GIFTS." PLATE II

5. Gift five, dimension and form.

6. Gift six surface, line and point, by use of sticks, rings and seeds.

7. Gift seven, contour by use of sand.

*Gifts*, is filled with amazement and admiration at their simplicity and at the same time at the profound insight and significance which underlie them.

### How the Kindergarten Play-Things

**Help the Child to Be Creative.**—The three essential elements or factors that go to make up the material universe by which the child is surrounded are *motion, matter, and measurement*. (For a fuller development of this most interesting subject of the psychology of nature, read *Cosmos and Diacosmos* by Denton J. Snider).

After years of thoughtful contemplation and many unsatisfactory experiments, Froebel at last gave to the childhood of the race these "kindergarten gifts" or play-things which, when rightly used, lead the child easily and naturally into a familiarity with the essential factors of all creative work, and thus save him from the blundering and experimenting through which the race has learned to do its work.

**First Gift.**—For example, when the child is playing with the soft worsted ball and string (see Plate I) he naturally almost instinctively swings it back and forth, soon heaving it right and left, then round and round. Most children imitate the motion of objects about them. If they do not, the mother or teacher can suggest that the child shall try to swing one arm from back to front, from right to left, and round and round. Then the other arm. Then one leg, and then the other leg. This is excellent physical exercise for the child's body. If accompanied by some simple childlike song or rhythmically measured beat of time such as "tie-tac, tie-toc" or "here, there," it gives much pleasure to the child. But it does far more than this. These three movements, together with the rolling and bounding of the ball, familiarize the child, unconsciously of course, with the fundamental modes of *motion* of the universe and help him to classify and use them in his small world.

**Second Gift.**—Again, the kindergarten child plays with the two-inch wooden sphere, cube and cylinder, the second gift (see Plate I). These are the geometric type forms that underlie all form in the world of *matter*. They are not given as object lessons in geometry, but merely to familiarize the child in his play with the essential forms of the outside world, and to help him to instinctively classify under the broadest possible general heads the myriad forms with which he comes in contact, and thereby to select the more readily the form he may need in his play for this or that purpose.

**Teach Primary Forms.**—Being simple type forms rather than approximations of the type, they do not confuse him with the non-essential details. As, for example, it is easier to see the resemblance of an apple and of a pear to a sphere than to see the resemblance of the apple and the pear to each

other. Their difference in shape confuses their resemblance. So, too, it can more readily be seen that a barrel and a knitting-needle are each similar in shape to a cylinder (if the child knows what shape the cylinder is) than to trace their resemblance to each other. The difference in dimension and in general appearance confuses the impression of form. So, too, it is much easier to see that a box and a chair have the same general cubical suggestion than to see their resemblance to each other—and so on, with the many forms which children use in their play.

**Form Combinations.**—The pleasure with which children detect these approximations to the geometric type is an evidence of the help that they are getting in their mastering of the world of form. Rightly used, these three simple forms furnish an almost endless number of suggestions and combinations for play. As many as forty or fifty different games have been created with them by one class alone. As, for example, they can be put in a bag and the child put his hand in the bag and name some object like the form he has sensed, or a street roller can be made by combining the three forms, or ornamental gateway by using several of each form, etc.

But, of course, their chief educational value is that they help the child to classify form and thus advance him in the great world of form and all that depends upon the correct use of form.

**Third Gift.**—Again the divided two-inch wooden cube (see Plate I), being divided according to its length, breadth and thickness, brings to the child's notice, incidentally, the *axial planes* made by thus dividing the cube, and also the *diametral lines* and *central point*. These are the simplest and yet the most fundamental of all surfaces, all lines and all points with which the child will ever have to deal in the thousand-fold use of surfaces, lines and points in the workaday world. They are not given for the sake of geometric terms, but because they are the simplest and can be most readily understood and used in constructing and designing. As this two-inch cube of the "third gift" is divided into equal parts, from back to front, from right to left and from top to bottom, it necessarily falls into eight one-inch cubes. Thus the child has for his familiar plaything the simplest possible form by means of which the great cosmic element of *measurement* can be given to him.

**Accuracy.**—The value of establishing the habit of accurate measurement can hardly be overestimated. By means of it, all forms, all sizes, all proportions are known, from the orbit of the farthest star to the shape of the minutest crystal. Without the mastery of measurement all invention of the industrial world, all creations of

the world of art are crude and clumsy; and to the degree in which they are properly proportioned are they useful or beautiful according to the purpose for which they are intended. The child by means of these small one-inch blocks gets acquainted with the present unit of *measurement* of all Teutonic and Anglo-Saxon peoples.

**Form and Measurement.**—However, it must again be stated that this almost universal unit of measurement is not given arbitrarily to the kindergarten child, but incidentally. He plays with his one-inch blocks; the inch check on his kindergarten table is always before him; the one, two and three inch sticks, folding paper, and other "organized materials" of the kindergarten all help to lead him to measuring and to comparing proportions in his hand work. It has been found by experience that the use of this definite mathematical unit of measurement—the inch and its multiples—does not restrict the free creative expression of children, but aids it by helping them to escape from the confusion and vagueness of undefined proportions. It also leads them the sooner to feel (not to know or to analyze) the beauty of true proportion, which, after all, is but the right use of measurement by the skilled artist. To a somewhat older child can be given a carpenter's rule, or housewife's tape-measure for length and more exact measurements.

This simple device of dividing a two-inch cube into eight one-inch cubes gives to the child not only the fundamental perceptions of form and measurement, but it familiarizes him, also, with number, size, direction and the other principles of construction of all kinds, in their most easily mastered embodiment.

Therefore the child is led to use this "third gift" in three distinct ways by the kindergarten or the mother who has taken a little time to master it herself. He finds that with it he can build houses, tables, chairs or other "forms of life"; can inclose given space, can build up given heights, or place the blocks at given distances, can count by means of them, or even learn to put them together, or add to, take away or subtract one, two, or more of the blocks from the eight, to make squares or oblong forms with them, and thus begin all unconsciously and without sense of fatigue, or fear of strained attention, the great discipline which mathematics have given to mankind. These last-mentioned plays or exercises are known as "forms of knowledge," using that term in its larger sense. Again, the blocks can be placed so as to make symmetrical forms, where one side balances another, around a common center. Many pleasing changes can be made by turning all the corners to the center or

turning the edges to the center, or alternating. Such play with balance and symmetry is known in the kindergarten as "forms of beauty." But it does not matter much what any of them are called provided the mother or kindergarten realizes that she can lead her children to represent in a general way the objects about them or those of which they have a mental picture; that she can lead them to exact mathematical expressions by means of these same blocks; or that with them, she can induce her children to love the beginnings of the art world, which are repetition, balance and symmetry.

Other objects, such as buttons, pebbles, leaves, nuts, can be played with and arranged in harmonious designs, until the child learns to love symmetry.

**Value of the Occupations or Play-Materials of the Kindergarten.**—In addition to the *gifts* or *play-things* provided by Froebel for the kindergarten, there are the *occupations* or *play-material*, not yet formed into any definite shape. These give freer scope to the child's creative instinct—that all-important instinct by whose use the child comes soonest into the consciousness of his inner-self. The *play-materials* of the kindergarten are selected with regard to their formability, or the ease with which they can be shaped by the child into any form he desires or can be changed by him from one form into another.

Instead of forms already made, he now turns to creating or making forms after his own fashions; in other words, he begins to learn the processes by means of which the inner properties of matter may be discovered, tested and used. Tools are needed to thus transform the materials of nature, only the simplest of hand-tools, such as blunt-pointed scissors, paste brush, pencil, weaving needle, but these are an introduction to that great world of machinery by means of which man has freed himself from much detailed work which once enslaved him.

It must always be kept in mind that the educational value to the child of any kind of hand work is not the form made, but the process, the changing from one shape to another, as the real aim of such work is to quicken the feeling of inner power, the faint dawning of the realization that the inner-self can change and remake the outer world to suit its spiritual and material needs.

Out of this instinctive longing of every human being "made in the image of God" to re-create the world—and thereby to prove to himself his divine power, have arisen all the arts and industries of mankind. The arts of sculpture, of architecture, of painting, of poetry, of the drama, and of music have all grown out of man's spiritual need of expressing or uttering

his idea concerning the personal appearance of his God, the shelter fit for his God's abode, the language in which to worship his God, the form of worship that he deemed pleasing to his God, the sounds and gestures by means of which he could utter his praises and his petitions. All the "fine arts" were, therefore, an effort to express the beautiful, the perfect, the divine.

The industries, or "useful arts," arose not so much from man's need of food, clothing, and shelter (which is the usual reason given for their origin), as that by having food, clothing, and shelter man would be freer to go forward with his higher development, namely, the calling forth of his own inner life and the inner life of his people. When the end is merely the getting of food, clothing and shelter, it is not educative, it does not develop the divine nature of man.

Of course, this was not consciously realized by the early race, nor should it be realized by the child. He is led to make "something pretty" or to make something that he can use in his play, or that can give pleasure to some one he loves. But the mother or teacher is to see to it that the materials furnished and the processes taught are simple enough for the

of man those most typical of the processes by which the materials of the earth had been formed into shapes to serve man's purpose.

**The Three Great Classes of the Work Done by Mankind.**—The occupations of man, broadly speaking, may be classified as *plastic*, *industrial* and *graphic*. In order that the child may begin, in his play, to get some idea of the *plastic* process, or shaping from without, which covers so many of the occupations of man, Froebel selected sand and clay, the two simplest of moldable materials. These the children of the kindergarten at first mold and press and pat into endless forms with their hands (man's first tool). A little later they are given hollow forms with which to mold wet sand and a simple wooden modeling tool with which to carve and shape their clay. Any one who has ever watched the delight they take in such occupations will wonder why digging in the sand and making mud pies, activities of childhood as old as tradition, were never before the time of Froebel elevated into educational instrumentality.

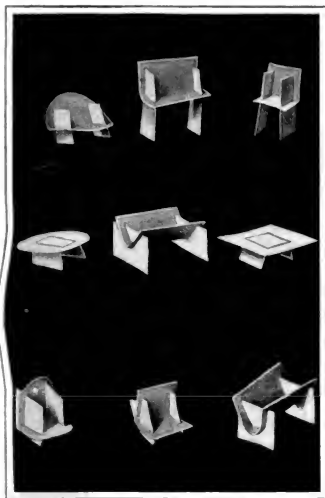
**Industrial Work.**—To help the child understand *industrial* process, or the taking apart of the materials of nature and the putting of them together in man-made fashion, Froebel selected paper



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child to make and remake with ease, as it must always be remembered that it is the *power to make* rather than the thing made which is of real value. Froebel, true to his insight that from the beginning of time man had been striving to attain this power to re-create the created world, selected from the innumerable occupations

of various degrees of thickness, which the child could learn to bend and fold into countless shapes, to prick with pricking needle, to cut apart, to fasten together again by means of intersecting planes, by weaving, by tying with string, by sewing with thread, or, sometimes, by pasting. The giving of too difficult materials, such as



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wood, tin, or leather, is apt to discourage the childish effort to reproduce the industrial process of the world, and would, therefore, hinder rather than help him in the learning these great processes by means of which most of the commercial activities of mankind are carried forward.

**Surface, Line and Point.**—In the industrial process of mankind, the surface, line, and point are the three essential elements used, no matter what kind of material is to be taken apart and put together in new shapes. Therefore the industrial occupations of the kindergarten include play with *points* by means of dotting, perforating, and cutting with scissors (as the cut line is but the succession of separating points)—as for example, pictures can be outlined on paper with a large pin; play with *lines* by means of weaving, intertwining, and sewing; play with *surfaces*, as in the fastening of surfaces together by interweaving, interlocking, and sewing, paper folding, and what, for the want of a better term is called "construction work," or the outlining of solids by means of surfaces. This process takes on many varying and interesting forms (see *Genetic Construction*, by Jessie Davis).

**Graphic Work.**—To help the child understand

the *graphic* process, or the representation of solid bodies upon surfaces (ordinarily called drawing), which is the third great division of man's creative, or remaking activity, the child is given chalk and blackboard, pencil and paper, or paint brush and water color paints and paper. This graphic process, or drawing with pencil or brush, calls forth the greatest amount of creativity on the part of the child inasmuch as it is the freest from the necessary limitations of all materials. With a bit of chalk, or a pencil, a child can reproduce a stone, a tree, a horse, a man, the earth, the sea, the sky, the moon, the stars, or anything else in the universe that has impressed him, and this, too, with less use of external material than was called for in his play with blocks, clay or paper. The mother or teacher must keep in mind that it is not how well the picture

is made that is important but that the *child shall be genuinely expressive of himself* by means of drawing, as for example, X meant to a three-year-old child "heaven, where the little angels play (above the slanting lines), and earth where the little children play (between the lines), and fairyland where the little fairies play" (below the slanting lines).

The mastering of the materials of nature in childish fashion, of course, begins with the very simple, and slowly adds the somewhat more difficult and more developed forms of hand-work in both the "gifts" and "occupations," so as to keep pace with the inner growing power of the child to use materials. If rightly understood both can be used advantageously by children much beyond the kindergarten age. For fuller explanations of the kindergarten gifts and occupations, the reader is referred to Froebel's *Pedagogics* and Dr. Snider's *Psychology of the Kindergarten Play Gifts*, chapter III, also to an excellent and practical book now in preparation (1910) by Miss Jessie Davis, entitled *The Kindergarten Occupations*, and Elizabeth Harrison's book, entitled *The Kindergarten Building Gifts*.

In learning to draw, the child is first

given chalk and board, or pencil and paper and allowed undirected use of the same. He begins aimlessly at first, but with great delight to mark dots, lines, and scribbling tangles of lines, but he soon tires of this and tries to represent some object. He is now ready to begin the organized drawing. The checked surface is given to him to guide his pencil. When he can consciously draw a straight line, a slanting line, a curved line, and lines of different lengths, the checked surface is discarded, and real drawing, albeit crude in form, begins.

Thus it will be seen that the playthings and the play materials furnished by the kindergarten for the child are not capricious toys nor haphazard materials, but are selected with the larger view of man's real significance in the universe as the creative child of God.

**The Play Instinct and the Games of the Kindergarten.**—What usually most attracts the looker-on in the kindergarten is the play circle or play ring. The attraction comes rather more from the unconscious grace which is so charming in children when at play than from any intellectual grasp of the real significance of play. Yet a definite advance was made in education when it was realized that play was the most natural and the deepest activity of a child between the ages of three and six and therefore the most educative.

**First Impressions.**—Until a child is about three years of age, he is absorbing impressions from the outside world, is learning how to use the various parts of his body—how to sit alone, to creep, to stand, to walk, to run, to climb, to grasp things, to pull, to drag, to tear, to understand the meaning of words and to speak words, as well as to dimly understand the law that governs solids by throwing things on the floor, by letting and pour through his fingers; to understand the law of liquids by splashing in his bath tub, by dabbling in bowls of water, by pouring water into and out of a vessel, by wading in shallow water, by the thrilling play with soapbuds if that great privilege is allowed him. He is testing the law of balance by balancing his own body in dangerous positions, by piling up blocks, books or other objects, and knocking them down. He is beginning to test space by creeping from one place to another, by pushing himself about by means of a chair, by almost senseless trotting about when he has once learned to walk; by adventuring beyond the home gate, sometimes to the horror of his mother.

All through these precious years he is growing, is strengthening his muscles and coordinating them so that they will work easily and readily together. He is testing his senses, and increasing their keenness and accuracy. He feels everything he can lay his hand on. He stares at all objects,



He listens to sounds and tries to reproduce them. He smells and tastes all sorts of things and the unthinking mother says "I never saw such a child, he is into everything. The moment my back is turned he is into mischief," whereas, in reality, he is only preparing himself to live; exercising and strengthening his body, testing the properties of matter, and finding that he can master the materials about him—make them roll, bend, twist, or tear, as the case may be—and that he can express himself by means of them. During this all-important period of life he is largely absorbed in himself and his mother or nurse, who to him is simply his helper, and he should be left as much as possible to this self-training. It hinders these first precious years of growth to have many people about an infant. It confuses him to have many changes made in his surroundings. Therefore it is harmful for young children to travel much or to have much excitement. They need a long, slow, quiet babyhood—healthful and happy with gentle "mother-play" to guide and direct. (Fröbel's *Mother-Play Songs* are as yet the best illustrations of the kind of baby-play that has been given to the world.)

But, at about three years of age the imagination begins to more definitely develop, and the social instincts begin to demand the companionship not so much of adults as of other children with about the same capacities and like interests. Almost all children, at this stage of development, make friends easily with other children. This desire for companionship of their peers and the impulse to put forth in play their inner life are as natural and as essential for fuller growth as was the absorbing in the previous period. It is at this stage that the organized play of the kindergarten supplies the needed form of activity. For the child prompted by growing imagination to seek self-expression and companionship should not be left to develop that divinely given imagination in capricious or wrong directions. It is here that the remarkable insight of Fröbel is again shown. Children have played since the beginning of recorded time—probably long before that—and certain vague ideas of guiding their play have been in the minds of men since the time of Plato. But it remained for Fröbel to regularly organize and establish play as part of the education of the child as soon as the social instinct is strong enough to desire companionship.

**Group Play.**—A mother can do much in the way of education by play with her child in the home. But the play will lack an important part of its real value unless it is joined in by other children. This kind of play is known as "group play," or in the kindergarten as "the play-ring," inasmuch as in the kindergarten the children usually gather together for their play in a circle,

thereby avoiding crowding and undue pre-eminence of any one child.

#### Characteristics of Kindergarten Games.

—The distinctive difference between the kindergarten games and the ordinary "street games" or "traditional games" is that the latter are often vague and aimless—sometimes even coarse and vulgarly suggestive. Many of them come from the idle and degenerate court-life of the past, drifting down through court servants to the peasantry of European countries and transported to America by them, whereas the kindergarten games retain the song, the repetition of the words and the rhythm that have made the traditional games attractive but put a new and better content into the play, keeping it free and childlike.

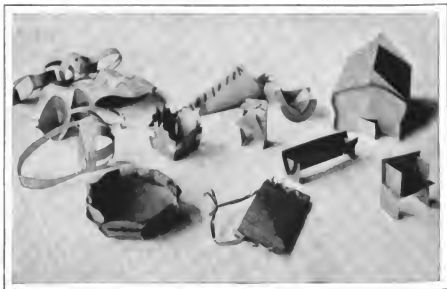
The games of the kindergarten usually begin with simple rhythmic movements of the body in time to music, either sung, or played upon a piano or other musical instrument; simple marching or hopping or skipping helps the child to definitely control his legs, catching and bounding a ball in time to music helps him to get definite control of his arms; simple childlike dances or rhythmic skipping with other children help him to get control of the whole body.

In what are known as "guessing games" one child leaves the room while the others decide on some one object that he is to discover by having described to him its properties—such as shape, color, texture, etc., or by the sound it can produce, or by some other testing of the senses of the

**Representative Games.**—Then come games in which the children represent with their arms a windmill, or the pendulum of a clock, or flying birds, or some other objects; or with their legs, pawing or galloping horses, jumping frogs, running fowls, or some similar activities. These are the beginning of the dramatic play which is so prominent a feature in the kindergarten. The instinct which makes all children reproduce in mimic play the activities of the world about them is the most important factor in a child's development, as it is the effort of the child to understand the actions of the world around him and a putting forth on his part of his inner impressions of the same.

**Dramatic Games,** in which the children impersonate first one and then another form of life, if wisely guided, are of inestimable value. They direct the child's attention aright and awaken his interest in the things which will be helpful to him; and by means of the right kind of dramatic play, a love of right doing and a dislike of wrong conduct can be aroused without any moralizing or awakening of morbid self-consciousness, which is so baneful to child life.

The dramatic games of the kindergarten, in which a group of children join together in one play, are based on those activities of the race which have been fundamental in lifting man out of his savage, half-animal state into civilized conditions. These are plays and games that dramatize family life by playing the protecting care and love of mother and father bird, or animal, and later



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child, who is then recalled and is expected to guess the object.

Soon are introduced more active games, depending on the cooperation of the whole group of children, such as marches, ring games, visiting games, and so on. (See Fröbel's chapter on "Play" in *The Pedagogics*.)

by playing the human activities of the home life. All children love to play father and mother and baby. It is this instinct which is understood and used aright in play. Again, all children love to play the activities of the economic world around them. They play they are baking or sewing, sweeping or dusting; dressing and undress-

ing doll-babies; or they are plowing, or reaping, or driving; or they are blacksmith pounding, or carpenter sawing or nailing, or any other activity of the world by which they are surrounded. Of the multitude of such activities the kindergarten selects the most essential in the production of food, clothing and shelter, and with the children she plays them zealously and in earnest if she is a good kindergarten. Later come the games that give the child in a less degree some idea of the state and the church, so that in the course of a year the little future citizens have played themselves into a dim consciousness of the great world of "ethical institutions" that surround and guard them and into a knowledge of which they must sooner or later come. Upon a right understanding of the laws that govern this ethical life of man depends so much of happiness or misery that the value of early learning concerning the same by means of play which attracts can readily be seen. But this play must always be kept joyous and childlike. That is the art of the kindergarten and it is a supreme art, inasmuch as it molds human souls and builds up beauty and nobility of character.

The games of the kindergarten have led to the introduction of dramatic play in the primary and advanced grades of the public school, and the simple rhythmic exercises have caused a general awakening to the consciousness of the meaning and value of the "folk dances" of primitive people. Discrimination, however, should be made between the early dances of nations that have developed into civilization and those of primitive tribes and races that still remain in savagery or barbarism. The latter contain little or no educational value, whereas the former were the primitive or childlike utterances by the founders of great nations of their feelings, by means of body gesture, rather than of defined thought.

These dramatic games and folk-dances have done much toward the right physical development of older children's bodies, and have also diminished the idle lounging and rough—frequently brutal—scuffling so often seen on school playgrounds. But their deeper significance as a means by which the inner life of the child can express itself is not yet fully grasped. It was the joyous play of the kindergarten that first deeply interested the Empress Frederika of Germany in the kindergarten, and later on caused her to have a portion of each park in Berlin set aside for a "spielplatz" or playground for the children, where sand-piles, swings, turn-poles, seesaws and other amusements are at hand to suggest some pleasurable and developing exercise. The idea has grown and spread until now there are hundreds of playgrounds in America alone.

**The Symbolism of the Kindergarten.**—But there lies a deeper meaning in the

kindergarten than merely the organization of the materials of nature and of human relationships, in order that the child may use the former creatively and the latter ethically, and so learn to live aright.

To Froebel, the chief aim of education was to obtain the right "world view" or the right idea of God, nature and man. In speaking of the organized gifts and games which he created for his kindergarten he says: "I have not only forms for the child's eyes which are to make him acquainted with the outward world which surrounds him. I have symbols which unlock his soul for the thought, or spirit, which is innate in everything that has come out of God's creative mind." (See *Reminiscences of Froebel*, page 210.) We have here the strongest and most definite statement of what is usually known as "the symbolism of the kindergarten." This phase of Froebel's work has been much misunderstood because it has been shrouded in mysticism by those who do not clearly understand the symbolizing power of the human mind. And yet, unless it is understood, one does not understand the full significance of the kindergarten.

Briefly stated, it is this: The inner-self, or soul, can only express itself and receive communications from other inner-selves, or souls, by means of a language created by itself. This the imagination of man creates for him by putting a new, or spiritual meaning into the images made in his mind by the sense-perceived world. For example, a mountain not only means, to the senses, a huge pile of rock protruding from the earth's surface, but it symbolizes to the inner-self great strength of soul; a dove not only means a small bird whose habits are peaceful, it symbolizes to the inner-self all gentle and kindly qualities of the human soul; warmth does not only mean the pleasurable sensation which the body receives from the rays of the sun, or from a fire, but it symbolizes to the inner-self enthusiasm, zeal and that earnest effort which is called "a warm interest in this or that." Men speak of "a square deal," of "a crooked life," "a bright idea," "a stinging rebuke," "a weighty matter," "a turn in affairs," "a strong grasp of a subject" and so on. All human language which pertains to anything beyond the mere animal existence of man is the result of this symbolizing power of the mind. All art is based on the fact that external forms, lines, sounds, etc., can be so used as to stir internal emotions. All religious rites and ceremonies are symbolic. Even the rites of baptism and communion of the Christian church are external ceremonies intended to symbolize the deep spiritual truths of the regeneration of the soul and communion with the divine. All that is meant by symbolization is the recognition of this power of the inner-self to imprint more than the outer-self can perceive

and to put its own meaning into the forms of the outside world.

Froebel perceived this natural symbolizing power in children and used it. He saw that what appeared as mathematical facts in the material world were analogous to, or suggestive of, the truths of the spiritual world. So the child playing with the mathematical laws feels the spiritual laws which they reflect. That which employs a child's activities interests him; what interests him he learns to like; what he likes he reflects in his conduct; what he does he becomes.

In playing with the essential elements of the created universe the child learns their laws and feels the inner law which they symbolize; as for example, playing with his box of blocks as a whole yet made up of many parts, each a whole in itself, he feels that he is a part of a larger whole of society, yet a distinct individual whole in and of himself. In his play he transforms one form into another and through familiarity with this simple external expression of evolution, he feels processes, the highest form of which is the great law of spiritual evolution, or growth. In his play of *The Bird's Nest* as he plays father or mother bird, or baby bird, he feels the universal relationship of family life. In his play with the materials furnished him he learns to find resemblances between things that seem to be entirely separated from one another; he learns to join opposites, and gradually he learns that there are no isolations in the universe created by the God "in whom we live and move and have our being." The failure to understand this phase of the kindergarten has arisen from the mistaken idea that the kindergarten was trying to teach the child to understand and to realize these deep spiritual truths, when she was merely giving him the external symbols which would arouse feelings for the same. (See Froebel's *Pedagogics of the Kindergarten*, the Baroness Marenholtz Von Blow's *Reminiscences of Froebel*, Susan Blow's *Symbolic Education*, Dr. Denton J. Snider's chapter on *Symbols in Psychology*, and Harrison's *Kindergarten Building Gifts*.)

In short the above may be summed up as follows: The child is led to exercise his creativity in order that he may, at first, feel and later on gradually come into a consciousness that there must be a creator, a maker behind all created or made things; and thus is met the deepest instinct of human nature—the longing to know God.

**Bibliography** that will be helpful in the study of this subject: Arnold's *Rhythms*. Barnard's *Kindergarten and Child-Culture Papers*. Blow's *Educational Issues; Letters to a Mother; Symbolic Education*. Froebel's translated *Mother-Play Songs*. Froebel's *Education of Man; Education by Development; Last Volumes of Pedagogics; Pedagogics of the Kindergarten*. Hallman's *Lives of Childhood*. Harrison's *A*



*Study of Child-Nature; Kindergarten Building Gifts; Misunderstood Children; Two Children of the Foothills. Hughes' Educational Laws. Penbody's Kindergarten Lectures. Salder's Commentary on Froebel's Mother-Play Songs; Life of Froebel; Psy-*

*chology of the Play-Gifts. Vanderwerker's The Kindergarten in American Education. Von Bilow's The Child; Reminiscences of Froebel. Milton Bradley, Springfield, Mass., manufactures nearly all the kindergarten supplies used in America.*



## PRIMARY EDUCATION

### IN ITS PRACTICAL RELATION TO PUPIL, PARENT AND TEACHER

Primary instruction very properly begins in the home. In no way can parents more helpfully cooperate with the school than by taking in hand the home-work, limiting it within reasonable time and holding the child to his best and most vigorous use of the time. In this way the home may supplement the school or become a check upon the school when such check is needed.

**The Child and His Mother.**—The world has recognized in art and story the sacredness of mother love. The intimacy of companionship between mother and child begins in the days of earliest infancy. We scarcely need Pestalozzi to teach us that in early education nothing can be compared with a mother's influence. The home training of a good mother is a preparation which sends the child out into life ready to profit by the best that life can give. The lullaby the mother sings her baby have in them more than calming into rest. "Sleep and rest, sleep and rest, Father will come to thee soon." They give faith in mother love and father care and lead to that larger faith which illumines adult years.

**The Child and His Father.**—In these days of prominence given to club life, and to "mothers' clubs" in particular, there is danger that the importance of a father's relation to the child be overlooked. The boy and his father, the father and his little companion daughter, these are comradeships that give the noblest impulses to home life.

It was a woman far past the meridian of life who wrote, "My most blessed memories are of my father. He was my first teacher and all through childhood he was my best friend. I learned to love whatever he loved and all that he loved was good and noble." Again a woman writes, "It is years since my father left me, but I can hear his rich voice now as he read to me out of my favorite books and gave me an introduction into the great world of his books." It is the father's privilege as well as the mother's to begin that nursery training that gives refinement and joy through all the coming years. What delight the child and father may have together as they wander hand in hand through storyland.

The father or the mother who is a good story-teller may be the child's greatest asset of bliss. The story hour may become not only the bright spot of the day but it may be looked back upon as the brightest spot of memory. Through the gentle art of story-telling the child may be given companionship and laughter and right teaching.

The ethical value of the story of moral conduct, the story that teaches without

seeming to instruct, is beyond any amount of deliberate argument—stories that inculcate the virtues of childhood, such as kindness, gentleness, obedience to parents, respect to the aged, honesty, self-denial, truthfulness, usefulness, sympathy. Stories of pure laughter are equally good, quick, responsive, joyous laughter. Oh, the merry heart of Eugene Field, and the merry heart of children who have laughed with him.

**The Child and the Teacher.**—It remains for an artist to express by brush or chisel what a noble-hearted teacher may become in the life of a little child—a radiance to guide throughout life. Such an influence was Pestalozzi, was Froebel, Arnold of Rugby, Horace Mann, Mary Lyon, Alice Freeman Palmer, and an innumerable host of others whose names are written in letters better than gold.

Superintendent Maxwell relates an anecdote of a teacher in his school, which shows the divine possibilities of such a worker. With the unmistakable Yiddish accent the Jewish mother exclaimed, laying a respectful hand on Miss K's arm: "I cannot help seeing how these children, they love you. You know my Bennie and Rosie? They're in your school. Do you know, lady, when you stand on that platform in the school and you say something it is just like when God speaks."

Owen Kildare gives a graphic account of the effect upon him of the first gentle touch he had ever felt. One day a strange woman, it must have been a mother or a teacher, patted him on the cheek and he tells us that he almost cried for joy. "With a light pat on my cheek and one of the sunniest smiles ever shed on me, she put a penny into my hand. She was gone but I realized what had happened. Somehow I felt that had she come back I could have said to her: 'Say, lady, I haven't got much to give, but I'll give you all my poipems, me pennies, and me knife if you'll do that agen.'" For such children it was written.

Give me no pity, but a place  
Where falls the sunlight on my face.

**Parent and Teacher.**—For the mutual helpfulness of home and school it is desirable that parents and teacher should know and understand each other better. Mothers are awakening to the need of child study and are appealing to teachers for guidance. Parents and teachers are seeking mutually for instruction and parent-teacher associations are formed. Through the intelligent direction of such organizations the school may arouse the home to a fuller sense of its duties toward the child's education, for often the ignorant or unthinking home is woefully lax. The physical and moral welfare of the child, through the

neglect of the home, must often become of the deepest concern to the teacher.

Moral development depends upon physical development. This means that the child's moral welfare must depend upon the economic conditions under which he lives, and just in proportion as we improve these conditions just to that extent do we increase the chances of the child to become a healthy, happy, moral citizen. No school has done its full duty unless it has aroused the entire community to a sense of its responsibility and acquainted it with the real meaning of intelligent cooperation in the training of children.

In some schools there are parents' meetings early in the fall for the purpose of giving teachers a chance to explain the studies to be taken up during the year, the method of procedure, the value of the subjects, and, if need be, the psychological reasons why particular studies occur at this point in the school course.

**Natural Understanding.**—The teacher should be intimate enough with the parent to talk candidly and freely about the interests of the child, and whenever peculiar conditions demand it, parents and teachers should together make a careful study of the nature and the needs of the child. Late entrance into school, irregularity of attendance, indifference to school work, physical defects, are important causes of retardation which can often be overcome to a great extent through intelligent cooperation.

No parent should trust for his understanding of the rules of discipline of the school to the fragmentary and biased account of a child's interpretation. It is a fine service to the school when parents can give the fact that the school exists for the sake of helping the child, and that the teacher is his good friend always.

The principal aid for children of incompetent homes must come from the school and the personal interest of the teacher. Of the worth of such a school and the method of such a teacher Judge Ben Lindsey has given this fine testimony: "Personal influence comes through personal contact, and since personal influence is perhaps the most powerful factor in moral or immoral development, there comes a grave responsibility to the teacher. With this responsibility comes also a great opportunity, that from the standpoint of service to mankind ought to be welcome, since there is no class of our citizens, not even parents themselves, who can do as are doing more to mold the character of the coming generations than the teachers in the schools."

**Home Study.**—The subject of "home study" has been regarded as so important that the National Educational Association gave it a place upon its program, and these are some of the points reviewed in round table discussion:

1. We must teach children how to study if we would secure the independence, concentration, organization, and persistence we desire.
2. Should children do any home study? If so, how much and when?
3. Parents should understand the aim of all home assignments and should agree with the teacher when the child should be given help in his work and where he should not.
4. Children get none too much sunshine as it is, hence the question of time for home study and time for play.
5. Children must be taught how to study, and this teaching should be by first guiding

them in pleasant work; then making them conscious of the process they are employing, noting its value and economy; third, arousing the will to do and to persist whenever desired; and fourth, selecting worthy subject-matter to give practice in the different fields—especially in concentration, persistence and independent thinking.

Home study fitted to advance this plan should in no way be detrimental to a child nor should it tax a parent unduly.

The following facts as formulated seem to be quite generally accepted: Children in the first four grades should be required to do very little, if any, study at home. The time out of school should be devoted to playing, occasional reading, and a little helpful service at home.

The children in the fifth and sixth grades should be required to do systematic reading at home under the direction of the

teacher. Such reading should be closely related to the study of subjects in geography, history and literature.

The children in the seventh and eighth grades should be required to study one subject, as history, at home, and also to do systematic reading which should be closely correlated with the subjects taught in school. The home reading should be carefully selected, and graded as the subject-matter of the regular course has outlined.

**WHEN THE CHILD FIRST GOES TO SCHOOL.**—For most children the first grade is the first year in school, as the majority of children cannot attend the kindergarten. The program of the first year should be organized to meet the needs of the six-year-old child so that he may adapt himself to the life of the schoolroom as comfortably as possible. Ample opportunity should be given for outdoor exercise and physical

development. The program of the first year work should include nature study, music, and handwork, language, reading, phonics, spelling, writing, some simple number work, not taken as separate and distinct subjects, but each illustrating and emphasizing the others, and all uniting to enlarge the child's experiences, to stimulate his curiosity, and to organize his knowledge. These subjects should be so arranged that they unify knowledge.

**Course of Instruction in Language for the First and Second Years.**—The following outlines of instruction for the first and second years in school are of the state of Illinois. They are arranged for the successive school months, have been adopted by a number of states and are among the best and most complete courses that have been worked out for the guidance of teachers. The course is adopted here without apology, because of its excellence.

#### FIRST YEAR—First Month

SUBJECTS	SELECTIONS FOR STUDY	SOURCES OF MATERIAL	PUBLISHERS
1. Original statements about the home of the child; its general appearance, its furniture, decorations, utensils and dishes. The occupations of the home.			
2. Nature stories.	The wee, wee man. Golden-rod and aster.	Cat Tails and Other Tales. Cook's Myths.	Flanagan. Flanagan.
3. Stories for telling.	Stories of the little red hen. Baird the beautiful.	Appleton's First Reader. Cook's Myths.	Appleton. Flanagan.
4. Mother Goose melodies.	This is the way we wash our clothes; London bridge; Pease porridge hot; Humpty Dumpty.	Nursery Rhymes.	Heath.
5. Fables.	The crow and the pitcher; The fox and the grapes.	Æsop's Fables.	Ginn.
6. Poems.	September; Golden-rod. The Noah's ark. To a honey-bee.	Nature in Verse. Pyle's Prose and Verse for Children. Alice Cary.	Silver-Burdett. Houghton. Houghton.
7. Songs to be memorized.	Autumn flowers. Golden-rod is yellow; The leaves party.	Songs in Season. Gaynor's Book.	Silver-Burdett. Silver-Burdett.
8. Picture study.	The cat family.	Adams (Perry Pictures).	Perry Picture Co.

#### FIRST YEAR—Second Month

1. Talks about the occupations of the father; his work and its purpose.			
2. Nature stories.	How Dame Nature got her frost; Seedlings on the wing; Clytie.	Cat Tails. Cook's Myths.	Flanagan. Flanagan.
3. Mother Goose melodies.	Old King Cole; One, two, buckle my shoe; If wishes were horses; Birds of a feather.	Nursery Rhymes.	Heath.
4. Fables.	The dog and his image.	Baldwin's Fairy Tales and Fables.	American Book Co.
5. Poems.	October's bright, blue weather; October's party; Lost, the summer; How the leaves came down. The rockabye lady.	Nature in Verse. Field's Poems of Childhood.	Flanagan.
6. Songs.	Come, little leaves. Farewell to the birds. Good-bye to summer. The woodman; The shoemaker.	Songs and Games for Little Ones. Gaynor. Eleanor Smith (II.).	Silver-Burdett.
7. Picture study.	Squirrels. The balloon.	Perry Pictures. Dupré.	

#### FIRST YEAR—Third Month

1. Getting ready for winter in the home. Laying in stores of food, fuel and warm clothing.			
2. Nature study.	The vapor family.	Cat Tails.	Flanagan.
3. Stories for telling.	Little Tuppen. History stories: Story of the Pilgrims, the first Thank- sgiving day; How fire came to earth.	Baldwin's Fairy Tales and Fables. Judd's Classic Myths.	American Book Co. Rand-McNally.
4. Mother Goose melodies.	Pussy cat, pussy cat, where have you been? I love little pussy; Little Boy Blue; Little Bo-Peep.	Nursery Rhymes.	Heath.
5. Poems.	November. Thanksgiving. The day is done. Jack Frost.	Alice Cary. Lydia Maria Child. Longfellow. Nature in Verse.	Farker's Classics.
6. Songs.	Thanksgiving song; November; Song of the nut. Jacky Frost; The farmer and the seller.	Songs in Season. Eleanor Smith (II.).	Flanagan. Silver-Burdett. Silver-Burdett.
7. Picture study.	Brittany sheep.	Rosa Bonheur.	

## FIRST YEAR—Fourth Month

SUBJECT	SELECTIONS FOR STUDY	SOURCES OF MATERIALS	PUBLISHERS
1. Preparation in home, school, and stories for Christmas.			
2. Nature stories.	The fairy Mercury; What the fire sprites did.	Cat Tails.	Flanagan.
3. Stories for telling.	St. Christopher; The Christ child. Christmas in other lands. Tiny Tim. The fir tree. Holy night.	Andreae Hufer's <i>Proudfoot</i> . Plan Book. Dickens. Hans Andersen. Mansel's <i>Child Stories</i> .	Flanagan.
4. Mother Goose melodies.	This little pig went to market; Mary, Mary, quite contrary; Hush-a-bye baby on the tree top; Ding dong bell, pussy's in the well.	Nursery Rhymes.	Heath.
5. Songs.	Away in the manger. Christmas carol. Why do bells for Christmas ring? Shine out, O blessed star.	Luther's Hymn. Gaynor's Book. Field.	Silver-Burdett.
6. Poems.	'Twas the night before Christmas; Hang up the baby's stocking; Little fir trees; The strange child's Christmas.	Whittier's <i>Child Life</i> .	Houghton.
7. Picture study.	Murillo's Holy Family; Sistine Madonna.		

## FIRST YEAR—Fifth Month

1. Winter sports. Animal life in winter.			
2. Nature story.	What broke the china pitcher?	Cat Tails.	Flanagan.
3. Stories for telling.	Story of the three bears; The little match girl. Farmer and The story of the year. Thor and his hammer. Lady Moon.	Classic Stories. Bevernson. Andersen. Foster and Cummings' <i>Asgard Series</i> . Whittier's <i>Child Life</i> .	Flanagan. Silver-Burdett, Houghton.
4. Mother Goose melodies.	Sing a song of sixpence; Baa, baa, black sheep, have you any wool? Three little kittens; There was an old woman who lived in a shoe.	Nursery Rhymes.	Heath.
5. Poems.	The star's fall; What the snowbirds said; The snow- bird's song; The first snow. The new moon; The drum.	Nature in Verse. Field's <i>Poems of Childhood</i> .	Flanagan.
6. Songs.	Twinkle, twinkle, little star; Tiny little flakes of snow; The snow clouds; January.	Songs in Season.	Silver-Burdett.
7. Picture study.	Madonna of the Chair.		

## FIRST YEAR—Sixth Month

1. Food used in the family. Sources and preparation.			
2. Nature stories.	The little brown seed; Pussy willow's hood.	Cat Tails.	Flanagan.
3. Stories for telling.	Prometheus. The great bear in the sky. Cinderella. Stories of the childhood of Lincoln, Washington and Long- fellow. Valentine stories.	Nature Myths, Cook. Judd. Classic Myths. Gathered from the best of their biog- raphies. Child's World, Poulsson.	Flanagan. Rand-McNally, Rand-McNally.
4. Mother Goose melodies.	Little Miss Muffet; Babes in the wood; When I was a bachelor. Adventureous buds; The crocus' soliloquy; The pussy willow. February.	Rhymes and Jingles. Nature in Verse.	Heath. Silver-Burdett.
5. Poems.	The flag.	Prose and Verse for Children. Gaynor.	Houghton.
6. Songs.	The drum; Hurrah for the flag. Baby Stuart; Feeding the birds.	Eleanor Smith (Song Book 1.). Perry Pictures.	Silver-Burdett. Silver-Burdett.
7. Picture study.			

## FIRST YEAR—Seventh Month

1. House cleaning. Plans for gardens of vegetables and flowers.			
2. Nature stories.	The towels party; The magnet's choice.	Cat Tails.	Flanagan.
3. Stories for telling.	The house that Jack built; The old woman and her pig; Jack and the bean stalk. Woden, the god of the northern sky; The legend of the north wind. The bag of winds; Echo, the air maiden.	Classic Myths. Foster and Cummings' <i>Asgard Stories</i> . Judd.	Rand-McNally, Silver-Burdett, Rand-McNally.
4. Mother Goose melodies.	There was a little girl; There was an old woman lived under a hill; Little Jack Horner; Curly Locks.	Nursery Rhymes.	Heath.
5. Poems.	The wind. How the wind blows; The tree—Björnson; A laughing chorus. How the little kite learned to fly. The duel.	Bevernson. Nature in Verse. Prose and Verse for Children. Field's <i>Poems of Childhood</i> .	Silver-Burdett. Houghton.
6. Songs.	March winds; My kite. The sap has begun to flow.	Educational Music Course for Elementary Grades. Eleanor Smith (II.).	Silver-Burdett.
7. Picture study.	Spring.	Corot.	

## FIRST YEAR—Eighth Month

SUBJECTS	SELECTIONS FOR STUDY	SOURCE OF MATERIAL	PUBLISHERS
1. The home garden. The return of the birds to the neighborhood.			
2. Nature stories.	Fish or frogs; Old Sol's rainbow; A living flow.	Cat Tails.	Flanagan.
3. Stories for telling.	Iris, the rainbow princess. Indian story of the robin. The legend of the anemone.	Classic Myths. Nature Myths. Classic Myths.	Rand-McNally. Flanagan. Rand-McNally.
4. Mother Goose melodies.	Old Mother Hubbard; Jack and Jill.	Nursery Rhymes.	Heath.
5. Poems.	The rain—Stevenson; April showers; Who likes the rain? The polliwog. The chicken's mistake. April fools. Hepatica.	Nature in Verse. Poems of Alice and Phoebe Cary. Nature in Verse. All the Year Round (I.).	Silver-Burdett. Houghton. Silver-Burdett. Ginn & Co.
6. Songs.	April, April, are you here? April. Rainbow fairies. Bubbles.	Songs in Season. Songs for Children. Child's Garden of Song. Child's Songbook.	Silver-Burdett. Silver-Burdett. Silver-Burdett. Silver-Burdett.
7. Picture study.	Feeding the bees.	Millet.	

## FIRST YEAR—Ninth Month

1. Making a calendar of May flowers. Excursions to garden and woods and fields to gather flowers.			
2. Nature stories.	The nest builders.	Fairy Stories and Fables.	American Book Co.
3. Stories for telling.	The three pigs; Puss in boots. Phaeton; Diana. The fast sowers. Legend of the dandelion.	Fairy Stories and Fables. Classic Myths. Andersen. Nature Myths.	Ginn & Co. Rand-McNally. Flanagan.
4. Mother Goose melodies.	A cat came fiddling out of a barn; Little robin redbreast sat upon a tree; I had a little pony, his name was Dapple Gray. Jack in the pulpit. Marjorie's almanac. Seven times one. The dandelion. The sugar plum tree.	Nursery Rhymes.	Heath.
5. Poems.	Jack in the pulpit. Marjorie's almanac. Seven times one. The dandelion. The sugar plum tree.	Whittier's Child Life. Nature in Verse. Jean Ingelow's Poems. Classic Stories. Poems of Childhood, Field.	Houghton. Silver-Burdett. McMurry.
6. Songs.	Dandelion fashions; America; Red, white and blue.	Eleanor Smith (II.).	Silver-Burdett.
7. Picture study.	The song of the lark.	Breton.	

## FIRST YEAR—Tenth Month

1. Talks about the birds and insects of June. The children can make many home observations and they enjoy reporting what they have seen.			
2. Nature story.	The story of the caterpillar and the study of cocoons.		
3. Stories for telling.	Story of the pea blossom; The town musicians. The origin of the woodpecker; How the robin got his red breast. Sing, sing, what shall I sing? As I was going to St. Ives; Mistress Mary, quite contrary. Seven times four. Little Nanette. Forget-me-not; Who was she? A fable.	Hans Andersen. Cook's Classic Myths. Nursery Rhymes. Jean Ingelow's Poems. Lucy Larcom's Poems. Nature in Verse. Nature in Verse.	Ginn & Co. Flanagan. Heath.
4. Mother Goose melodies.			
5. Poems.			
6. Songs.	Buzz, buzz, this is the song of the bee; A summer lullaby.	Eleanor Smith (I). Merrill.	Silver-Burdett. Silver-Burdett.
7. Picture study.	The melon eaters.		

## SECOND YEAR—First Month

The work of this year consists of the long poem of *Hiccupha*, history stories in the form of conversation lessons, fables, classic stories, short poems, and picture study. As in the first year this outline is based upon the Illinois course of study, which has been adopted by several states.

SUBJECTS	SELECTIONS FOR STUDY	SOURCE OF MATERIAL	PUBLISHERS
1. Hiawatha's childhood, Lines 64, chapter III, to end of chapter. Teacher tells the story, then reads from the poem. Children memorize and act out portions of the story, arranged in form of natural dialogue. Select such portions as children can read readily for their reading lesson. Make use of sand table, paper cutting and drawing.			
2. Stories, tell and play	The wolf and the seven kids. The happy family. The walnut-tree that wanted to bear tulips. Rheucus. Apprentice John. Pippa.	Language Reader II. (Baker & Carpenter). Andersen's Fairy Tales. Cat Tails. Lowell's Poems. The Child's World, Poulsson. Browning.	Macmillan. Flanagan. Parker's Classics. Flanagan. Merrill's Stories from the Masters.
3. Fables.	The last dream of an old oak. The dog and his image; The dog in the manger.	Andersen. Æsop's Fables.	Ginn & Co.
4. Conversation lessons.	The tree dwellers; Shelter, food; Animal enemies.	Dopp's Tree Dwellers.	Rand-McNally.
5. Poems.	A vagrant knight and lady. Little Boy Blue. My shadow. Two wise owls.	Tree Top and Meadow, McMurry. Eugene Field. Stevenson. Tree Top and Meadow. Zuber.	Pub. Sch. Pub. Co. Pub. Sch. Pub. Co.
6. Picture study.	Primary school in Brittany, or September.		

## SECOND YEAR—Second Month

SUBJECTS	SELECTIONS FOR STORY	SOURCE OF MATERIAL	PUBLISHERS
1. Hiawatha's friends. Conversations about these friends until the personality of each one stands out as real. Teacher read to the class. Read choice passages again and again. Children read, dramatize, memorize.			
2. Stories, tell and play.	King Midas. The fiddler and the oak. A fish and a butterfly. Aqua.	Language Reader II. Classic Myths. Child's Stories from the Masters. Wiggin's Story Hour.	Macmillan. Rand-McNally. Rand-McNally. Houghton.
3. Fables.	The wolf and the crane; The frog who wanted to be as large as an ox.	Æsop's Fables.	Ginn & Co.
4. Conversation lessons.	Tree dwellers; Story of the wild horse; The tree man's tools; Learning about fire.	Dopp's Tree Dwellers.	Rand-McNally.
5. Poems.	Autumn fire. A chestnut burr. Leaves and children. The wee fairy. Wyken, Blinken and Nod.	Tree Top and Meadow. Nature in Verse. Longfellow's Poems. Alice Cary's Poems. Eugene Field.	Pub. Sch. Pub. Co. Silver-Burdett. Houghton.
6. Picture study.	The return to the farm.	Troyon.	

## SECOND YEAR—Third Month

1. Hiawatha. Story of Mondamin, chapter V. Tell story and then read to class. Have children retell the story in parts.			
2. Stories.	Stories of Thanksgiving; The first Thanksgiving; A Boston Thanksgiving. Old time Thanksgiving.	Child's World, Poulson. St. Nicholas.	Flanagan.
3. Fables.	The lark and her young ones; The boy and the wolf.	Æsop's Fables.	Ginn & Co., also Parker's Classics.
4. Conversation lessons.	Tree dwellers. How the tree men made their first shelter; The first baskets. How they learned to cook their food; Their ornaments.	Tree Dwellers, Dopp.	Rand-McNally.
5. Poems.	Talking in their sleep; The fairies in winter; The night workmen. The pumpkins.	Tree Top and Meadow. Whittier's Poems.	Pub. Sch. Pub. Co.
6. Picture study.	Pilgrim exiles; The return of the Mayflower.	Boughton.	

## SECOND YEAR—Fourth Month

1. Hiawatha's sailing. Description of the canoe. Work out in painting, paper folding, etc.			
2. Stories.	The angel's promise; The manger; The mother of a king; The king's first journey; The boy in the temple; The story of the first Christmas. Christmas in other lands.	Stories from the Bible and from Hofer's Christ-Child Tales. Plan Book.	Flanagan.
3. Fables.	The lion and the mouse; The wind and the sun.	Æsop.	Parker's Classics.
4. Conversation lessons.	Cave men; The first cave home; The making of fire; Skin dressing and the making of clothes; Skin water-bags; Hunting the mammoth.	Tree Dwellers and Early Cave Men, Dopp.	Rand-McNally.
5. Poems.	While shepherds watched their flocks by night. Christmas carol. Christmas eve; Santa Claus' petition; Kris Kringie—Aldrich.	Deland. Longfellow's Poems. Tree Top and Meadow.	Pub. Sch. Pub. Co.
6. Picture study.	The arrival of the shepherds.	LeRolle.	

## SECOND YEAR—Fifth Month

1. Hiawatha's fishing. Describe the sturgeon. Tell story of the struggle, of the rescue.			
2. Stories.	The valiant blackbird (learn and play). The story of the New Year. The bird with arrow feathers. Parsifal. The milky way.	Language Reader II. Anderson's Fairy Tales. Classic Myths. Child's Stories from the Masters. Angard Stories, Foster and Cummings.	Macmillan. Parker's Classics. Rand-McNally. Rand-McNally. Silver-Burdett.
3. Fables.	The donkey and the salt; The fox and the stork.	Æsop.	Ginn & Co., also Parker's Classics.
4. Conversation lessons.	The eskimo; Descriptions of the northland and the northland people; The reindeer and his usefulness.	Eskimo Stories.	Rand-McNally.
5. Poems.	The ferns; The frost; Snowflakes. A New Year's greeting. Wintertime poems.	Tree Top and Meadow. Lowell's Poems. Riley's Rhymes of Childhood.	Pub. Sch. Pub. Co. Houghton.
6. Picture study.	The bells.	Blashfield.	

## SECOND YEAR—Sixth Month

SUBJECTS	SELECTIONS FOR STUDY	SOURCE OF MATERIAL	PUBLISHERS
1. Hiawatha's wooing, chapter X.			
2. Stories.	One eye, two eyes, three eyes. The giant with the belt of stars. Beasties. Stories of boyhood and youth of Washington, Lincoln, Franklin. Stories of St. Valentine; Stories of carrier pigeons.	Language Reader II. Classic Myths. Stories from the Masters. The "True Story" series by Brooks. Child's World. Æsop. Eskimo Stories.	Macmillan. Rand-McNally. Rand-McNally. Century Company. Planagan. Ginn & Co. Rand-McNally.
3. Fables.	The boy and the frogs.		
4. Conversation lessons.	The eskimo; His house, food, dress; Eskimo dogs and their use.		
5. Poems.	Mt. Vernon bells. The flag goes by. A Norse lullaby, Pitypat and Tippytoe. To mother's fairy. Lady Moon.	Plan Book. Tree Top and Meadow. Eugene Field. Cary's Poems. Tree Top and Meadow.	Planagan. Pub. Sch. Pub. Co. Houghton. Pub. Sch. Pub. Co.
6. Picture study.	A helping hand.	Emile Reneuf.	

## SECOND YEAR—Seventh Month

1. Hiawatha's wedding feast, chapter XI.			
2. Stories (learn and dramatize).	Why the sea is salt. Where frogs came from. The Angelus. Spring and her helpers; North wind at play. The four winds.	Language Reader II. Classic Myths. Stories from the Masters. Child's World. Andersen.	Macmillan. Rand-McNally. Rand-McNally. Planagan. Ginn & Co.
3. Fables.	The ant and grasshopper; The goose that laid the golden egg.	Æsop.	Ginn & Co.
4. Conversation lessons.	The eskimo; Hunting the seal and the bear; Life in the igloo; Children's games among the eskimos.	Eskimo Stories.	Rand-McNally.
5. Poems.	March. The wind. Waiting to grow; Windy night, Stevenson. March. Night wind, Stevenson.	Celia Thaxter's Poems. Frank Dempster Sherman. Tree Top and Meadow. Wordsworth. Child's Garden of Verse.	Pub. Sch. Pub. Co. Parker's Classics. Rand-McNally.
6. Picture study.	At the watering trough.	Bonveret.	

## SECOND YEAR—Eighth Month

1. Hiawatha's picture writing, chapter XIV.			
2. Stories.	The ugly duckling. Proserpine. Saul and David. Little Gustava. Old pipes and the dryads. The story of Easter.	Language Reader. Classic Myths. Old Stories of the East. Thaxter. Stockton's Fanciful Tales.	Macmillan. Rand-McNally. American Book Co. Parker's Classics.
3. Fables.	The quarrel; The wise goat.	Fairy Stories and Fables.	American Book Co.
4. Conversation lessons.	The cliff dwellers; Their homes, food, water, weaving, pottery, home customs, religious ceremonies.	Lotami.	Pub. Sch. Pub. Co.
5. Poem.	Crocus; Song of the lilacs; At Easter time; The secret; What robin told me; The throats.	Tree Top and Meadow.	Macmillan.
6. Picture study.	The willows.	Corot.	

## SECOND YEAR—Ninth Month

1. Hiawatha. Death of Kwasind, chapter XVIII.			
2. Stories.	Sif's golden hair. Why the narcissus grows by the water; Pegasus. May thirtieth.	Asgard Stories, Foster and Cummings. Classic Myths. Cot Tails.	Silver-Bordett. Rand-McNally. Planagan.
3. Fables.	The horse and the stag; The father and his sons.	Æsop.	Ginn & Co.
4. Conversation lessons.	Lake dwellers; Their home in the lake, clothing, implements, occupation.	Lake Dwellers.	Pub. Sch. Pub. Co.
5. Poems.	Robert of Lincoln. Little white lily; Frogs at school. The swing, Stevenson.	Bryant. Tree Top and Meadow. Child's Garden of Verse.	Parker's Classics. Pub. Sch. Pub. Co. Rand-McNally.
6. Picture study.	Dance of the nymphs.	Corot.	

## SECOND YEAR—Tenth Month

SUBJECTS	SELECTIONS FOR STUDY	SOURCE OF MATERIAL	PUBLISHERS
1. <b>Hiawatha.</b> The coming of the white man's foot, chapter XXI. The departure of Hiawatha, chapter XXII.			
2. <b>Stories.</b>	Hans and Gretel. Why the partridge stays near the ground; The myth of Orpheus. The fax flower. May blossom.	Language Reader II. Classic Myths. Andersen. Grimm.	Macmillan. Hend-McNally. Ginn & Co. American Book Co.
3. <b>Fables.</b>	Review of fables of the year.		
4. <b>Conversation lessons.</b>	American Indian; His home, food, shelter, occupations, customs, education.	American Indians, Starr.	Hesth.
5. <b>Poems.</b>	June. The swallow; Discontent; The quail's nest. Daffodils. At the court of Queen Flora. The emperor's bird's nest. The sandpiper. The aurora.	From Lowell's Vision of Sir Launfal Tree Top and Meadow. Wordsworth. Nature in Verse. Longfellow's Poems. Celia Thaxter's Poems. Guido Reni.	Parker's Classics. Silver-Burdett.
6. <b>Picture study.</b>			

**Picture Study.** A picture study has been suggested for each month of the elementary course, but many teachers are themselves untrained in the study of pictures and need help. Books that will help in the study of pictures: *Masters in Art* (series of monographs), Bates and Guild Co., Boston. *Picture study in elementary schools*, Macmillan. *Story of art and artists*, Macmillan. *Studies of master artists*, Houghton-Mifflin. *Perry Picture Company and Brown Picture Company* sell both penny and five-cent pictures which are very good for class study. Get large and fine engravings whenever possible.

### LEARNING TO READ—READING TO LEARN.

—The mechanics of reading are so difficult that during the first and second years the energy of the reading lesson must be directed chiefly toward learning to read. This does not mean that the first reading lessons have no thought content, but this content comes at first chiefly through the suggestion of the teacher. But this is all to be changed. By the time the child has reached the third or certainly the fourth year in school the mechanics of reading should have been pretty thoroughly mastered. He reads independently now to get the thought for himself. If books have been presented to him in the right way the printed page becomes an open door by which he enters a storyland. He enters because he loves it and reading is no longer a compulsion.

Two motives are strong enough to make any intelligent child a good reader—to read to himself because he wants to know, and to read aloud to others because he wants to make them understand the thing that is so well worth knowing. This involves two things—well selected reading and companionship, some one at hand, mother or father or teacher or class, to whom there is some joy in telling the story gathered from the printed page. It is not necessary to describe the method of such a lesson or the spirit of such a teacher.

**Drill in Phonics.**—As children are to be made self-helpful they must be taught the method of attacking new words in their daily reading. Phonics drill should be given daily in all the lower grades.

At first train the ear and vocal organs to recognize and imitate sounds. Clear, distinct oral expression should be secured before any attempt is made to teach the written form. Not a few of the difficulties met by the child in mastering the mechanics of reading would be removed if his ear were trained to hear the correct sound. Very careful attention should be given to each child's ability to speak distinctly. If defects of hearing or speech are detected they should be attended to at once, for often such defects may be corrected in the young child.

After a little oral drill in clear and correct enunciation, written representations of sounds may be given, beginning with con-

sonants and long and short vowels. New words which occur in the reading lesson should be broken up in the oral spelling lesson into syllables and spelled by sound or the sound of the vowel in the accented syllable should be given. As early as the second school year children should be able to pronounce with a fair degree of confidence almost any word that occurs in their reading lesson if they have been given the help of the accent and a few diacritical marks.

Exercises like the following may be multiplied for phonic drill: Review the consonant sounds in words with long or short vowels, and without using marks except over the first word of the groups. Place the phonogram at on the board. Let the pupils build the group of words *fat, bat, cat, hat, mat, rat, sat*. Beginning with *ate* they will construct the group—*ate, fate, gate, slate, plate, date*. In like manner use *an* and *one, ad* and *ade, ap* and *ape, ag* and *age, am* and *ame, ack, ake* and *ace, ang* and *ange, and, ank, act, amp, ash*. Notice the effect of final *e* on the sound of *c* and *g*, and also on the sound of the preceding vowel.

Then take the phonograms containing short or long *e, i, o, u, y*, and make families of words as above. Give exercises in the same way with initial and terminal consonants: *sh, ch, wh—she, shall, shell; cash, hash, lash; chin, chip, chick, chick; much, such, touch; which, when, while, white*.

Drill on final phonograms in words of more than one syllable: *ing—coming, having, making, taking, living; er—hunter, mother, shiver, farmer; en—seven, garden, chicken, broken, woven; ed—safest, surest, sweetest, dearest, kindest, honest; ed—lived, asked, raised, looked, wished, called, learned; er—waves, makes, takes, moves, loves, comes; or—sailor, honor, favor, savor; ed—hatched, bonnet, jacket; y—pithy, duty, stormy; ny—sunny, funny, bunny; ly—slowly, truly, lovely; ty—kitty, empty, plenty*.

In this way take other combinations and give frequent and thorough drills until the child can immediately produce the vocal sound from the written symbol. It is not sufficient to think that a sound once learned has been acquired. It must become a habit to speak with distinct utter-

ance. Use phonics not only as a key to new words, but as an exercise in articulation. Divide words into syllables. Give drills on the small words that are frequently slurred over, *as to, was, of, for, from, get, just, can*. Attention should be given to voice and expression, such as characteristic good conversation.

Such systematic drill in phonics should succeed for the child the correction of bad habits of speech, such as nasal tones, drawing, dropping final sounds, mumbling, talking without movement of lips and jaw, and every kind of indistinct utterance, and in addition should give him power to read the printed page for himself.

**Story-Telling as a Language Exercise.**—Children delight in hearing good stories and in telling them again and again. The old, old story is the favorite. With the telling of the story there is often free dramatic action which may be developed into a fine method of interpretation. The story-teller gains power and freedom in the use of language. He enriches his vocabulary by unconsciously using the words of others; he enriches his life by entering into the lives of others and understanding the essential relation between motive and conduct.

The story may be made the basis of all kinds of language exercise. As in the first and second grades what the child reads becomes the center of the school program, so in the third grade language expression becomes the leading thought.

As *Hiawatha* has proved a very attractive story center for the second grade, so *Robinson Crusoe* has been found to furnish an excellent center for history, geography, and language in the third-year course. From the fourth grade, on through the grammar course, history and geography form two important and interrelated centers of interest and study around which crowd many human interests and from which any amount of language teaching may be derived.

**Written Work** should follow as a natural sequence the oral lesson. Artificial writing is poor writing. The child talks because he wishes to talk and he talks well. In the same way he should write because he has something to write about. The technique of the art of good writing is laid down in a succession of well-organ-

ized lessons in our language books, but the practice of this art belongs to every lesson in the school and to the habit of every day. The study of grammar in the upper grades is important only as it becomes an intelligent means to the one great end, power and fluency in the use of the mother tongue.

**Reading to Children.**—It has been often repeated that the teacher must know literature and must read often to her class and that above all she should be a good reader as well as a good story-teller. Parents and teachers, all who mingle with little children, should know and love the books and poems that the children love. Let the teacher practice on a few of the best poems and read them to her class with responsive appreciation in her voice and she will never again be afraid that she cannot learn to read or that she cannot hold the interest of her class. A few beautiful poems are suggested here as suitable selections. Let each teacher add to these others of her own choosing. Select a few poems that appeal most strongly and then read those again and again until the words seem to be their very own. Let the teacher do this and she will in time find herself classed among the very few who are worthy to be called good readers.

#### Poems to Read to the Children

Rock-a-bye, thy cradle is green. . . . .Nursery rhymes.  
The world is so full of a number of things. . . . .Stevenson.  
What does little birdie say. . . . .Tennyson.  
Twinkle, twinkle, little star. . . . .Jane Taylor.  
Angels at the foot. (Watching Angela). . . . .Christina Rossetti.  
The lullaby. . . . .Joseph Gilbert Holman.  
Jam and jelly and bread are the best of food for a child. . . . .Edward Lear.  
The quangle-wangle's nest. . . . .Nonsense Book.

#### Poems that Children Love and Books that Help in Story-Telling

And I must follow, would I find  
The inward riches to all this wealth of life.

Ingen. . . . .One thousand poems for children. . . . .Jacob Co., Geo. W.  
Hazard. . . . .Three years with the poets. . . . .Houghton.  
Ward. . . . .Poems every child should know. . . . .Doubleday.  
Smith, Eleanor. . . . .Song books I and II. . . . .Milton Bradley.  
Matthew. . . . .Poems of American patriotism. . . . .Maynard-Merrill.  
Barrie. . . . .Famous poems explained. . . . .Hinds, Noble & Elledge.  
Lear. . . . .Nonsense rhymes. . . . .Little.  
Palgrave. . . . .Child's treasury of English song. . . . .Macmillan.  
Bryant. . . . .How to tell stories to children. . . . .Houghton.  
Houghton. . . . .Stories to tell to children. . . . .Houghton.  
Harrison. . . . .Telling Bible stories to children. . . . .Houghton.  
Frye. . . . .In story land. . . . .Central Pub. Co.  
Wiles. . . . .Two children of the foothills. . . . .Sigman Pub. Co.  
Wiggin and Smith. . . . .The place of the story in early education. . . . .Ginn.  
Wiggin and Smith. . . . .The story. . . . .Houghton.  
Baldwin. . . . .The story. . . . .Houghton.  
Burd. . . . .Fifty famous stories retold. . . . .Am. Book Co.  
Burd. . . . .Prose every child should know. . . . .Doubleday.  
Mable. . . . .Myths every child should know. . . . .Doubleday.  
Foster and Cummings. . . . .Legend stories. . . . .Silver-Burdett.  
Baldwin. . . . .Old stories from the East. (Bible stories). . . . .American Book Co.  
Richards. . . . .Five minute stories. . . . .Little.  
Richards. . . . .Golden windows. . . . .Little.  
Foulson. . . . .Through the farmyard gate. . . . .Lothrop.  
Foulson. . . . .In the child's world. . . . .Bradley.  
Seadler. . . . .The children's book. . . . .Houghton.  
Harrison. . . . .Uncle Remus. His songs and sayings. . . . .Appleton.  
Frye. . . . .Wonder story. . . . .Harper.  
Fairly tales from Andersen and selected tales from Grimm belong to every child. For other books of poems and stories see lists of books for children's library. Some books have been given in both equal to the teacher and to the child.

**LANGUAGE AND LITERATURE.**—Under teaching the child how to read, a detailed outline of suitable material arranged for first and second year language has been given, but the question may still be asked by the mother or the teacher how to instruct the little ones who are beginning to read. What is the method

To-whit to-whit to-wheel Who goes to the bird's nest. . . . .J. M. Child.  
To-whit to-whit to-wheel Who goes to the bird's nest. . . . .C. G. Rossetti.  
Great, wide, beautiful, wonderful world. . . . .W. B. Randa.  
Many, many, many, a minute! . . . .Christina Rossetti.  
What does the bee do? . . . .Christina Rossetti.  
Baby wants a lullaby. (Innocent's lullaby). . . . .William Brightly Randa.  
This is the way the ladies ride (The nursery song). . . . .William Canton.  
Baby bye, here's a fly, let us catch him, you and I. . . . .Joseph Gilbert Holman.  
Over hill, over dale. (Midsummer Night's Dream). . . . .William Shakespeare.  
O Lady Moon. . . . .Christina Rossetti.  
While shepherds watch their flocks by night. . . . .Found in Golden Numbers.  
Dark brown is the river. (Where do the boats). . . . .Robert Louis Stevenson.  
When the elf king went to battle. (The Magic Casket). . . . .R. C. Lehman, Alfred Noyes.  
As soon as the fire burns red and the stars sleep (The Fire-fairy Palace). . . . .Josephine Dodge Daakam.  
There is ever a song somewhere, my dear. . . . .James Whitcomb Riley.  
The wind-broom sweeps so wondrous clean. (The Wind-Broom). . . . .Richard Burton.  
As I walked over the hills one day. . . . .A. Nursery Song, Fire-fairy Palace.  
There's a merry brown thrush. . . . .Mrs. Carter.  
Now the day is over. (Child's evening hymn). . . . .Sabine Baring-Gould.  
Both at home and in school read reread. *Bed in Summer Time, I Saw You Toss the Kites on High, A Child Should Always Say What's True, How Do You Like to Go in a Swing!* Rossetti's *Who Has Seen the Wind? O Lady Moon, What Does the Bee Do?* Field and Riley and Cary and Others: *Waiting to Grow, Plump*

*Little Baby Clouds, Sleep, Baby, Sleep, Rockabye Lady.* Jingles from the Jingle book and over and over read the rhymes of Mother Goose. Sometimes read selected psalms. Read with reverence and exaltation until the children, too, catch the uplift of the words. "When I look up unto the hills, behold Thou art here?" "The heavens declare the Glory of God, and the firmament sheweth His handiwork."

#### Suggested Material for Help of Teachers.

—The teacher of language and literature must know literature at its best. She must appreciate the double aim of language teaching—facility in the correct use of language and appreciation of good literature. For herself she needs the stimulation of the best that has been written and for her class she needs to know the literature for her grade. This is especially true for the teacher of the little ones. She must know the literature that children love, their poems and their stories, and she must practice well the art of story-telling.

The book-loving teacher will have a book-loving school. To lead children to the proper use of books the teacher must know children's books and enjoy using them.

An occasional period set aside during the week for the purpose of talking over with the children the books they have read will be found valuable. Every schoolroom should contain a library selected for the use of every child in every grade. Nowhere is the privilege of individual selection more valuable than in the choice of books. When "learning to read" has given place to "reading to learn" and "reading to enjoy" then the drudgery of learning has been overcome.

#### For Children at Home and the First Two Years in School

Jewett. . . . .The three baby bears. . . . .Dutton.  
Burgers. . . . .Baby days. (Songs and pictures). . . . .Stokes & Co.  
Burgers. . . . .More gooses and how not to be them. . . . .Stokes & Co.  
Greensward. . . . .Under the windward. . . . .Warne.  
Potter. . . . .The tale of Mrs. Jeremy Fisk. . . . .Warne.  
Ginn. . . . .Fairytale, ed. by Mrs. Fisk. . . . .Ginn.  
Adelberg. . . . .Clean Peter and the children of Grubby. . . . .Longmans.  
Lear. . . . .Nonsense rhymes. . . . .Little.  
Flanagan. . . . .Child stories and rhymes. . . . .Flanagan & Co.  
Mother Goose, or the old nursery rhymes. . . . .Warne.  
Ginn. . . . .Mother Goose melodies, or songs for the nursery. . . . .Houghton.  
Æsop. . . . .Child's version of Æsop's Fables; ed. by Sienkiewicz. . . . .Ginn.  
Andersen. . . . .Fairytale; selected and edited by Ursula. . . . .Maynard.  
Brooks. . . . .Stories of red children. . . . .Ed. Pub. Co.  
Bennet. . . . .Little Indian book. Little brothers of the West. . . . .Stokes.  
Turpin. . . . .Child's book of poetry. . . . .Clasman.  
Hollbrook. . . . .Hilawatha primer. . . . .Houghton.  
Alexander Blake. . . . .Graded poetry. Separate volumes for each grade. . . . .Merrill.  
Andrews. . . . .Seven little sisters. Each and all. . . . .Ginn.  
Brown. . . . .Stories of woods and fields. . . . .Globe.  
Burd. . . . .Little Boy Blue and his friends. . . . .Little.  
Long. . . . .Nursery rhyme book. . . . .Warne.  
Richards. . . . .Five minute stories. . . . .Estes.  
Foulson. . . . .Child stories and rhymes. . . . .Lothrop.  
Graver. . . . .Sachetonee tales. Overall boys. . . . .Rand McNally.  
Picture books by Nelson, Warne, Turk, Dutton, bring a wealth of joy into the nursery.  
Story of the three little pigs. . . . .Warne.  
Story of the three bears. . . . .Warne.  
All sorts of animals. . . . .Nelson.  
Animals and their young. (Natural history series). . . . .Turk.  
Cinderella and Red Riding Hood. . . . .Dutton.  
Cock and Hen. (Cock and Hen farm series). . . . .Turk.  
Our dogs. (Picture land series). . . . .Turk.  
All about wild animals. . . . .Turk.  
Johnny Crow's garden. . . . .Warne.

or what are the steps in the process? Very little is heard nowadays about word method, sentence method or phonic method as separate methods in themselves. The best teaching chooses from all methods. **How the Several Methods May Be United in the First Reading Lessons:** 1. Words as wholes. (a) Use of objects repre-

senting the word; (b) spoken word used in connection with the object; (c) the word as form, either script or printed form—the object, the idea, the vocal symbol, the written symbol, all in combination.

2. Words in combination. (a) Groups of words or words grouped in phrases; (b)



words arranged in sentences, grouped in paragraphs or as story wholes.

3. Analysis of words. (a) Words broken up into sounds—phonics; (b) words broken up into separate forms—letters.

### The Eclectic Method as It Has Been Outlined for a Training School—

1. Conversational work whereby teacher gains knowledge of child's interests, intelligence, maturity, habits, home training, environment, and use of English. Here objects are often introduced.

2. (a) Blackboard work. Action sentences largely such in form and in content as have been used by child in conversational work. (Thought and sentence method.) (b) Discovery of parts of sentence words. (Word method introduced.) (c) Discovery of parts of words, letters, names and sounds of letters. (Phonic method.)

The test of good teaching is the drill that follows the development lesson. After the child has learned the nature of word symbols and has acquired a small reading vocabulary the importance of such drill exercises must be emphasized.

### Analysis of a general plan for reading drill—

1. Preparation through word mastery.

2. Results to be obtained. (a) Recognition of words at sight, (b) correct and easy enunciation, (c) mastery of sound and form elements, (d) knowledge of their meaning.

3. Methods by which this word mastery is acquired. (a) Writing new words, (b) reading new words, (c) spelling by sound and by letter, (d) meaning of new words, (e) use in original sentences. Briefly summarized, the reading drill should fix vocabulary and form word images.

4. Reading the new lesson. The test of good preparation is the grasp of thought and feeling as expressed through good vocal expression. The three arts of education—seeing, reading, thinking—should be combined in every reading lesson.

From the beginning give the child in his lesson something worth thinking about and from the first give him an interested audience—a teacher and a class who care for what he reads and will listen with interest. This will lead the child in his reading to form the habit of complete thought and complete expression as found not only in the single sentence but in the entire selection. Then what he reads will seem to him worth while and he will learn to love the printed page. As has been fully said, he will enter the path "which our forefathers blazed through the wilderness and make of it a highway down which he may ride a king in his power to use the English language."

### Things to Be Remembered in Teaching Reading.—1. Teach only such words as are needed for use.

2. Keep a complete list of all words taught. 3. Keep a separate list of all words found difficult. Review and review until mastered.

4. Call for silent reading. Have child tell you what he has read.

5. Call for silent reading of dramatic passage. Have child act out what he has read.

6. Again call for silent reading, this time a longer passage. Have child tell in his own words what he has read.

7. From the very first sentences require natural tones. This can easily be done by simple, natural questioning.

8. Do not let any member of the class interrupt one who is reading aloud. There should be confidence, not confusion, when one is reading.

9. A few minutes of rapid drill in cor-

rection of errors common to the class is a good preliminary exercise. The teacher should correct, but not nag. Remember that drill exercises should be short.

10. Encourage every child to do his best and when he has done his best receive it in a pleasant, gracious manner. Children are sensitive to the atmosphere of approval. Encourage, suggest, do not repress.

11. Young children cannot study undirected. Work of a definite, concrete kind should be assigned to them. Through occupation they learn concentration.

12. Make the sentence or the thought a unit. If skillful questioning lead the child to the thought he is to give you from the reading, as, What did the dog do? Why did he like the boy? Such indirect help is the best way of suggesting right expression.

13. Short daily exercises of a rapid, decided, vigorous character should be given to train the class to quick recognition of words and sentences. It is a great gain in education to make a person quick and resourceful.

### Suggestions and Devices for the Inexperienced Teacher.—

The experienced teacher has long ago invented many of her own devices, has outgrown them and invented others. There are no fixed methods of teaching. It is a continual round of interesting change, the more interesting to the original mind which is always inventing something new. It must be remembered, however, that novelty is not the aim, but growth. The growing teacher welcomes that which adds new interest or in any way yields better results.

1. The first language lesson must begin with oral exercise—something interesting to talk about.

2. The point of thought is the sentence. The child gives his thought, and the teacher writes it on the board, underlining the important word. It may be the child tells what he picked up from the table, as, "I have a book." Other children tell theirs, as, "I have a ball." "I have a box." Each child finds his own story and his own particular word. This game of hide and seek gives rest and holds attention. It may be worked out in many ways.

3. Write the children's names. Let each child find the name of some other child or the age of some other child or the brother of some other child. Such exercises can be multiplied. The teacher makes her crayon talk, and the children talk to her. Write a nonsense rhyme upon the board. Read it to the class. Read again, pointing slowly to each word. Let children point to principal words.

B was a bat who slept all day,

Brown little bat!

Some teachers have enriched the child's fancy by adapting Lear's *Nonsense Rhymes* to the teaching of the alphabet.

C was a cat, crafty old cat.

D was a duck, dear little duck.

The pictures and the words make good seat exercises for copying.

4. Find and pronounce all words on the board containing a given letter, as c, f, c, etc.

5. Arrange the words of a paragraph in alphabetical order.

6. Write on the blackboard or on paper all the words of the reading lesson beginning with a certain letter. Instead of writing on the board the material in the word boxes may be used.

7. Words written upon the board promiscuously, so far as the initial letter is concerned, are to be grouped alphabetically in columns, each group with the initial

letter at its head. Many forms of dictionary work may be given. Children must learn the alphabet, but there are better methods than the old mechanical method of the a, b, c's.

8. Build or write in columns all the words containing a given vowel sound.

9. Write in columns all words containing a given phonogram.

10. Words of the lesson are written on the board. Words are erased one by one and the child tells which word was erased.

11. Arrange words in duplicate columns except that the order of words is changed. Give to one of the class a pointer, and have him point to a word pronounced by the teacher. The game consists in seeing which child points first.

12. A child finds and pronounces all the words with a given ending or a given beginning. Valuable for prefixes and suffixes.

13. The teacher points to a word, the child reads and gives a sentence containing that word.

14. The singular form of nouns whose plurals are formed by adding s may be written upon the board. Let the children build the plural form by adding s.

15. Draw a doll house. Let children tell what furniture they want to put into it. Write these words in a column. Let children furnish by pointing to word and then to the place in the house where the furniture should be. Make, mark, or write word in the house. Picture of a ball game might be done in the same way.

16. Have pupils look through a paragraph and tell what has been read.

17. Have pupils look through a sentence or paragraph and act out the meaning.

18. Have pupils read a paragraph silently and illustrate the meaning by drawings or a series of drawings.

19. Give dialogue exercises frequently where one child replies to another. Encourage dramatic expression in voice and body.

20. The teacher should often read to the class and with the class. Exact imitation is not wanted but through suggestion and the glow of her spirit the teacher may awaken her class to the love of interpretative reading.

### Three Essentials in the Teaching of English.—

1. Fixing the word in the child's vocabulary. 2. Fixing the word symbol through the activity of the eye and ear and hand. 3. Centering attention upon thought, rather than mere symbol getting, that in the end the child may gain mastery of thought and speech.

### Suggestions for Seat Work Related to Primary Readings.—

1. Seat work should be related to the lesson. The aim in all exercises should be to train the child to look for something in the lesson and expect to find it. It is the active mind, the attentive mind, that can be educated.

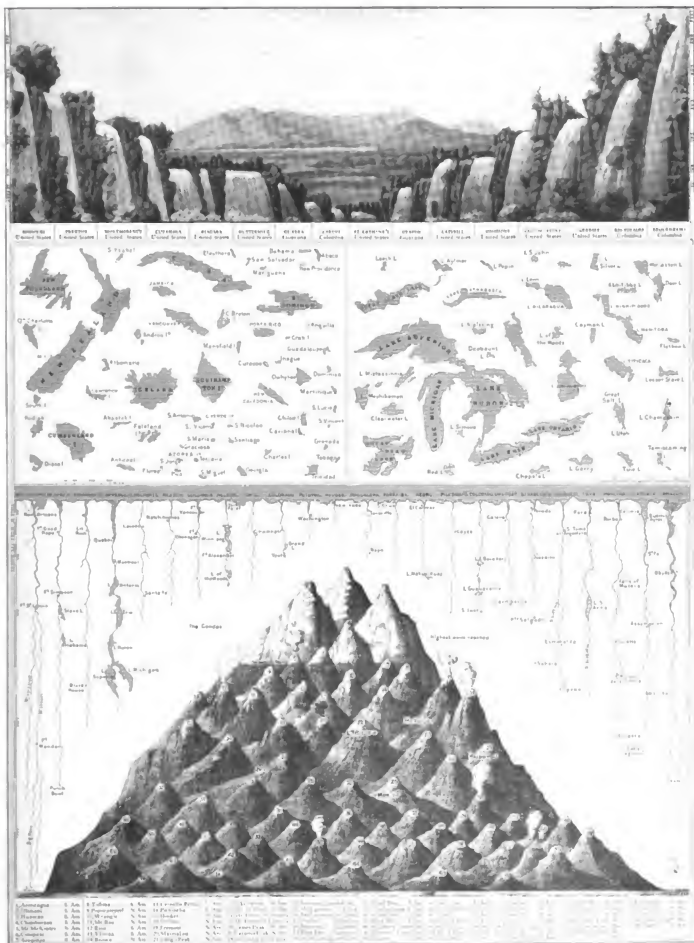
2. Provide worn-out books, magazines, advertisements, etc. which can be cut up. Provide blank books, one for each child. Print the letters of the alphabet on the board. Let the children find them, cut them out, and paste them neatly in order, a at top of page 1, b at top of page 2, etc., to z.

3. New words occurring in the reading lesson may be printed or written on the board; children may find these words cut them out, and paste them on the proper page. This will give each child the printed vocabulary of his grade. When they can read words children may make dictionaries or word books by writing the words instead of cutting and pasting.

4. Put several alphabets in the same









canal boat. 4. The lock; its walls and gates. 5. Paving the lock.

Excursions may be made to a dairy, a creamery, or a grain field, a harvest field, a flour mill, a bakery, a stream of water, to lake or ocean if near at hand, to a vineyard or orchard, a brick or a tile manufactory, a lumber yard, a place of house building. It is not necessary to make many excursions, but a few well selected typical ones, and care must be taken that time and attention of the class be well economized both in the excursion and in the recitation.

**School Excursions in Europe.**—In Germany, France, Holland and other countries of Europe school excursions for the primary purpose of the studying of geography and history are organized on an extensive scale. Nearby excursions are planned for the little ones and long journeys to distant places for the older classes. Very careful preparations are made so that the child shall have both physical and intellectual benefit. Sometimes several vacation weeks are planned out in this way, the aim of which is primarily education and not vacation sports as would be the case probably in America.

**The Use of the Text-Book.**—The right use of the text-book when first put into the hands of the child is so important that the New York state syllabus gives this advice to the teacher: "The elementary text-book in geography is usually the first book placed in the hands of the children which they are expected to study for the purpose of obtaining information, and for that reason it is extremely important that its use should be carefully taught. This is best done by discussing each day in class the lesson for the next day, and at the close of the oral work assigning the same lesson for study. Later the children should be called upon to recite upon the text. After a little it will be sufficient to point out during the assignment of the lesson the items of greatest importance, adding thereto 'search questions' the answers to which may be found in the text." It may be added that to teach a child how to study is as important as what to study. There is a deplorable lack of this knowledge even among the men and women in our universities.

By the aid of the text-book and the globe the class should first become acquainted with the relation of the great land masses and the ocean. They should also be given a larger view of the earth as a great ball in space "whose surface is varied by continents and oceans and upon which the sun and moon shine from a distance."

**Pictures and Illustrations.**—Pictures and illustrative material should in every grade be freely used. Illustrations cut from magazines and other sources should be selected and preserved under suitable covers. The children, if encouraged to do so, will bring from their homes a vast amount of material that will illustrate the subject and make it interesting. The children of the fourth grade in their large general view of other countries may begin books of illustration which will become to them a delight.

Stories form the best illustrations, stories about other people and where they live and how they live. In every grade geography correlates closely with the other work of the grade.

The study of industries furnishes an abundance of material for the best sort of modern arithmetic, and the stories of in-

dustry, people and products, when retold by the children, furnish excellent drill in the use of correct English.

**Map Making and Map Study.**—As the class advances more times should be given to map study and to the studies of the globe. The map is the written language of space relation. Every bit of our geography work is done with reference to location, and the map. It is well to understand the making and reading of the map, and the use of the scale. Make a plan of the school-room, taking measurements with the foot rule or yard stick, drawing the plan to scale, using a half inch or quarter inch to the foot. Enter the desk, stove, etc. Next make a map of the school yard, using a measuring tape or a ten-foot pole and practicing the measurement of such distances by "stepping" or "pacing" it off. Plot a before, using a smaller and appropriate scale. Enter the schoolhouse, out-buildings, roadway, trees and other prominent objects. It will be an easy step to the idea of charting a larger area, like the farm; then the teacher in a single lesson or so, may draw a map of the township, with the schoolhouses located in it, with other prominent features; then the county map, with the township conspicuous in it; then the state, with the county made prominent; the United States, with the state under observation, and North America, with the United States for observation.

As the child advances in the study of maps they should be made so full of meaning to him that he will take delight in learning from a new map as much as is possible before turning to the text. Throughout the grades considerable use should be made of large wall maps and relief maps as well as of the globe.

The following suggestions for the upper grades follow the course of study marked out in the Illinois syllabus. The work of the first grade should be first general—the making and reading of a map, and an acquaintance with the globe; then a trip around the earth in a study of the continents, with interest centered in the people and their industries. The second half of the year may be devoted to a study of the home county and state, and the physiographic regions of America (United States).

The work will be done according to a topical outline, which will fix the order of study and recitation. This outline may be placed on the board and left a few days until it is memorized by the class. With the outline any text may be used or several different ones may be in the hands of the pupils at the same time. Then, too, the whole library, and all the outside reading of pupils and teacher may be brought to bear upon the recitation. With the use of this outline should go a considerable drill upon a few place names, say about twenty-five, fixing them firmly in mind by map drill. The pronouncing vocabulary in the text-book should be in constant use.

Continuous map work should be done on maps supplied to the pupils, or on tracings they may make. A regular series of maps may be made for each continent, the pupil showing by tinting with colored pencils the great forests, grassy plains, deserts, races of men, areas of production of the leading commodities, trade routes, largest cities. These maps, finished neatly from day to day and approved by the teacher, will accumulate into a little volume as the pupil's own work.

**Geography in the Upper Grades.**—Above the fifth grade the point of view and emphasis change to another phase of

geography. In the previous grades the work was largely observational and descriptive in character, because the observational and imaginative activity of a child were then dominant. The pupils have been growing older, other mental activities have been coming forward which make it not only possible but necessary that the rational side of the subject shall be introduced more and more as the work progresses. By rational geography is meant the study of the subject matter from the point of view of cause and effect. In the study of the Sahara desert, for example, the arid conditions should not only be described, but they should be traced backward to their causes and forward to their effects on the life, habits, dress, and occupations of the people. The culminating interest in geography centers in the life of man, his occupations, his commerce and manner of living. Almost any one of these topics, if traced backward to its causes and determining conditions, soon ends in certain conditions of his physical environment. It is necessary to understand the physical environment of that life. The attention given to this side of geography in the previous grades has been more to the securing of good, clear mental pictures of physical features and the acquisition of facts than to the explanation of those features and facts. In this second study of physical environment, emphasize the processes concerned and the forces at work introducing that environment.

**Geography and History.**—Passing from the physical to the human side of geography we find how intimate are its relationships with history. Quoting from Dr. McMurry, "An examination of our whole course of study in geography will show that the historical considerations have largely shaped it, first America fully treated, then the movement toward Europe with an elaborate study of its large topics, and later the journey outward from Europe to the rest of the world."

**Type Lessons.**—The following type lessons are taken from McMurry's *Special Methods in Geography*. They illustrate the intimate relationship that exists between the study of geography and the literature of travel and biography and history, and how the study of geography can be enriched by well selected reading:

"A trip around the world on the parallel of the home. This forms an interesting base-line, on each side of which cities and countries can be ranged and a helpful comparison of diverse countries be made."

"A trip around the world on a meridian. This brings out all the contrasts of climate, the similarity of northern and southern hemispheres and the differences."

"Steamboat voyage around the world. This is means of discovering the position of different continents and oceans and some of the peculiar things of ocean navigation. These three excursions may serve to give the children a more definite idea of the geography of the world-whole. Pictures should be freely used as well as supplementary reading from books of travel."

**Geography Topics Parallel With American History Lessons.**—Journey across the Rocky Mountains. (Stories of Fremont and Lewis and Clark.) The Canyon of the Colorado River. (Story of Major Powell.) The Plateau of Colorado. The land of Mexico. (Story of Cortes.) Florida and the southern states. (De Soto and La Salle.) The trade route to India.

(Columbus and Da Gama.) The map of the world in Columbus' day. The equatorial current, trade winds, and Gulf stream. (Voyages of early navigators.)

"Champlain's voyages and explorations with a careful survey of the geography of

the whole, the St. Lawrence, Nova Scotia, Lake Champlain, the Ottawa river, the homes of the Iroquois and Hurons, the Atlantic Ocean and France."

"Hudson's voyages and explorations, the Pilgrims and the voyage across the Atlantic, Captain John Smith and his

exploring trips, Boone and the passes of the Alleghenies, Raleigh's expeditions, Washington's early life.

Map and blackboard sketches should be freely used. Pictures and sand maps, and all the means of concrete illustration needed to insure clear and correct notions.

#### BOOKS FOR THE STUDY OF GEOGRAPHY ARRANGED BY GRADES

**Reference Books for Teachers, Third Grade.**—Long, *Home Geography*, very elementary (American Book Co.); Tarr and McMurtry, *Home Geography*, first edition, for grades three and four (Macmillan); McMurtry, *Lessons in Home Geography*, illustrated lessons and exercises fully described (Macmillan).

**Books for the Children's Shelf, Third Grade.**—

*Doese, the Indian Boy*, Snedden (Hought.).  
*Our Own Country*, Dutton (Silver).  
*Seven Little Sisters: Each and All* (Ginn & Co.).  
*Around the World*, first book, Carroll (Silver).  
*Geographical Nature Studies*, Payne (American Book Co.).  
*The Snow Baby; Snow Land Folk*, Ferry (Stokes).  
*Big People and Little People of Other Lands*, Shaw (American Book Co.).  
*Children of the Palm Land*, Allen (Educational Publishing Co.).

**References for Teachers, Fourth Grade.**—McMurtry, *Special Methods in Geography* (Macmillan); McMurtry, *Topic-Lessons in Geography* (Macmillan); Trotter, *Lessons in the New Geography* (Harpers); Frye, *Brooks and Broad Basins* (Ginn); McCormick, *Suggestions on Teaching Geography* (Public School Publishing Co.); King, *Methods and Aids in Geography* (Lothrop).

**Books for the Children's Shelf, Fourth Grade.**—Tarr and McMurtry, *Around the World*, second book, Carroll (Silver).  
*The Stories of My Four Friends*, Andrews (Ginn & Co.).  
*Lozaria, the Little Lake Dweller*, Ward and Edson (Appleton).  
*Hans Brinker: Life in Holland*, Dodge (Scribner).  
*Heidi, Story of a Little Girl's Life in Switzerland*, Spitt (Ginn).  
*East, the Great Boy; Boy's Life in Switzerland*, Spitt (Ginn).  
*Four American Explorers*, Kingsley (American Book Co.).  
*Great Navigators*, Verne (Scribner).

**Explorers of the Nineteenth Century**, Verne (Scribner).  
*Wandering Heroes*, Abraham, Isaac, Joseph, Price (Silver).  
*Little Cousins Series*, several volumes, Wade (Page).  
*Family Plays*, several volumes, Gale (Lothrop).  
*The World and Its People*, three volumes, Dutton (Silver).  
*Story of Little Joe, the Dutch Boy*, Konrad, the Swiss Boy; *Mitsun, the Japanese Boy*, Campbell (Educational Publishing Co.).  
*Ten Boys on the Road From Long Ago to Now*, Andrews (Ginn).  
*Indians and Pioneers*, Hazard and Dutton (Silver).

**Reference Books for Teachers, Fifth Grade.**—Tarr and McMurtry, *North America*, second book (Macmillan); Redway, *The New Basis of Geography* (Macmillan); McMurtry, *Topic-Studies of North America*, part I. (Macmillan); Macmillan, *Lakes of North America* (Gleil & Thiner); *Nature and Man in America* (Scribner); Patton, *Natural Resources of the United States*, Science Primer series (American Book Co.).

**Books for the Children's Shelf, Fifth Grade.**—*Geographical Readers*, separate books for each country, Carpenter (American Book Co.).

*Pictorial Geography Readers*, six volumes, King (Lothrop). Each grade should be supplied with good wall maps and a globe, on geography; also separate state geographies.

*Stories from Little Storyland*, Livingston, Marden (American Book Co.).  
*Around the World*, third book, Carroll (Silver).  
*Little Journey Series*—Switzerland, France, Holland, Italy, Germany, Australia, Japan, China, South Africa, MacQuinn (Pittenger).  
*Around the World in the Sleep Train; Far West and Far East*, Sloum (Scribner).  
*Pioneer History Stories; Pioneers of the Mississippi Valley*, McMurtry (Macmillan).  
*Pioneers on Land and Sea; Pioneers of the Rocky Mountains and the West*, three volumes (Macmillan).  
*Heroes of the Middle West; The Story of Tully*, two volumes, Catherwood (Ginn).  
*The Boy Traveler; Travels in Many Lands*, given in several volumes, Knox (Harpers).

**NATURE STUDY.**—Pestalozzi said that the child's first tutor is nature, and her tuition begins from the moment that the child's senses are opened to the wonders of the surrounding world. Since his time nature study has been defined as "learning those things in nature that are best worth knowing to the end of doing those things which make life most worth living." Its aim is a happy, helpful adjustment. It is to set the child in the midst of nature as a companion worker.

**The School Garden.**—"To this end," happy, helpful adjustment, "the school garden has proved most practical." Froebel recognized this long ago. "It is of the utmost importance," he said, "that every child should acquire the habit of cultivating a plot of ground. Nowhere as in the vegetable world can his action be so clearly traced by him, entering in as a link in the chain of cause and effect."

**Value of School Gardens.**—What do the children get out of the school garden? The teaching of the child is brought into contact with life, and, best of all, the lives and experiences of the children. The point of contact

reaches the home interests just as directly as those of the school. The tiny garden of the school is sure to be duplicated at the home—probably on a larger scale; and this alone worth the whole effort. The responsibility of the garden develops strength and independence in character. Honest effort wins. Judgment, as well as physical effort and steadfastness of purpose, is demanded.

The first school garden in the United States regularly authorized by a board of education was planted in Boston in 1891, but the value of such school instruction was recognized as early as 1824, when it was argued that "Agriculture and the Gospel are the two great instruments of Divine Providence to check the voluptuousness and exercise the virtues of man." In 1900 vegetables were first planted in this Boston garden. Since that time the development of school gardens and the advancement of agricultural education in the United States have been very great.

**How the School Garden May Become a Vital Part of the School Instruction.**—A few practical illustrations from two of our own American schools will show how the school

garden may become a center of great interest and a vital part of school instruction.

Connected with the school garden is a chicken yard. The children visit it every day, and the subject of the subject in daily conversation with their teacher. This is the story as they told it to her one day:

We went to see Biddy.  
Biddy sat very still.  
She looked at us.  
We stood near Biddy's nest.  
She was not afraid of us.  
We would not hurt her.  
Biddy had eleven little chicks.  
They were white, black, and yellow.  
They said, "Peep, peep, peep."

The teacher wrote these stories on the blackboard as the children told them to her and they became their reading lesson. Then she wrote for them this story on the blackboard and they read it to her:

I think that when a little chicken drinks, he takes the water in his bill.  
And then, he holds his head up so that the water can run down his bill.

The children copied all these sentences on paper and illustrated them with drawings and free-hand cuttings of their own.

The stories were read and reread—many times, with delight. Later the teacher taught them how to tie the leaves together to make a book and they were taken home as a gift to father and mother. Thus the nature-study became through correlation a conversation lesson, a reading lesson, a writing lesson, an art lesson, a number lesson (counting the chickens), training in manual skill (making the book and working out the illustrations), and, above all, an ethical lesson in the noble art of giving.

Another day the children came in with their hands full of flowers. The teacher read them these words and taught them the song: "Consider the lilies of the field, how they grow; they toil not, neither do they spin: And yet I say unto you, that even Solomon in all his glory was not arrayed like one of these. Wherefore, if God so clothe the grass of the field, which to-day is, and to-morrow is cast into the oven, shall he not much more clothe you, O ye of little faith?"

I heard the robin singing  
His happy morning song,  
I saw his help-mate bringing  
Their breakfast to the young;  
And to me came a whisper  
In words that softly fanned the trees:  
"If God for these so careth,  
Will He not care for thee?"

I saw the roses growing  
In beauty day by day;  
No queen in all her glory  
So lovely in array,  
And on the leaves were written  
Sweet words of love and trust for me:  
"If God so doth the rose,  
Will He not care for thee?"

**ARITHMETIC.—First Steps in Number Training.**—Arithmetic in the first three grades is called "number work." It expresses in the simplest way the numbering sense or the counting instinct by which the child first gets hold of quantitative values in his environment. First year number work to the child is largely incidental, though the teacher must have definite aims and purposes. The simplest way to get number ideas in to count small groups of similar objects and find "how many" in a group. The mere rhythm of counting is pleasing to children, counting by 1's to 100; by 10's and 5's to 100; by 2's to 12 or 20; by 3's to 12 or 15; count backward by 1's and 10's. Children will have practical use for this knowledge in connection with games, songs, stories, manual work, and in the daily business of the schoolroom and the home. Through rhymes and jingles as in this *Ten Little Indians* song they have the concrete lesson, the physical exercise and the merry game all in a delightful combination.

One little, two little, three little  
Indians.  
Four little, five little, six little  
Indians.  
Seven little, eight little, nine little  
Indians.  
Ten little Indian boys.

Ten little, nine little, eight little  
Indians.  
Seven little, six little, five little  
Indians.  
Four little three little, two little  
Indians.  
One little Indian boy.

Games in great varieties may be arranged which will bring into exercise this number sense and the delight of dramatization.

Reading and writing numbers may be taught the first year to one hundred and the second year to one thousand. Make practical use of numbers taught, as finding

pages of books, numbers of houses, etc. The teacher must always study her class and suit her pace to theirs.

Teach various forms expressing number relations, as: Three and three are six. Six divided into twos are three twos. Three twos are six. Six less three are three. Two threes are six. One-third of six is two. Six divided into threes are two threes. Two-thirds of six are four.

With the operation teach also the appropriate sign as +, −, =, ×, ÷.

Appropriate combinations for drill should be presented after the child has formed a concrete image of the number relation. He should see one-half and be able to think one-half before he is asked to repeat the statement that one-half of six is three.

**Developing the Idea of Fractions.**—Children easily grasp the idea of fractional parts, but the teacher should keep in mind the completeness of the fractional idea, as Professor David Eugene Smith in his monograph on the teaching of arithmetic has pointed out in the following illustration:

"We should remember that a fraction, say  $\frac{1}{2}$ , is commonly used in three distinct ways, and that it is our duty to see that little by little all these become familiar to the child. These ways are as follows: 1.  $\frac{1}{2}$  of a single object, the most natural idea of all, the breaking of an object into 2 equal parts. 2.  $\frac{1}{2}$  as large, as where a six-inch stick is  $\frac{1}{2}$  as long as a foot rule, not half of it, but half as long as it is. This is essentially the ratio notion, and it is necessary to the child's stock of knowledge, but it is not necessary to make it hard by talking about ratios at this time. 3.  $\frac{1}{2}$  of a group of objects, as in case of  $\frac{1}{2}$  of 10 children."

**New Facts and Processes.**—Whenever new facts and processes have to be learned they should be learned in comparison with known facts. The child should handle and measure and by the aid of drawing get graphic representations of mathematical relationships. Use different magnitudes. Do not neglect to follow up with abstract drill work. Drill, fix, learn. Abstract drill work may be made as interesting as concrete, for all the joy of the game element in education may be made to enter into it.

**Seat Occupation for Number Work in Primary Grades.**—Devices for making number work practical have been worked out in great abundance. Every resourceful teacher has devices of her own. A few have been gathered here as suggestions.

Make pasteboard rulers 4 inches long, a foot long. Mark off into inches. Later mark off into fractions of an inch. Use these rulers in measuring many things. Compare lines, surfaces and solids, with similar lines, surfaces and solids, as. This line is three times as long as that line. This line is one-fourth as long as that line. This rectangle is one-half that rectangle. Find lines and surfaces in the room, and compare. Teach the child to see many things through the one. Unless that which he sees aids him in interpreting something else his observation is of no use to him. Cut, fold, paste, paper furniture according to directions. Paint flags or cut badges of paper for holidays.

Rule lines, squares, oblongs to dictation and scale, sheets for weather record, record sheets, score cards for games. In all construction children should make the necessary computation to get total lengths and breadths and effect of any allowances, e. g., laps in making boxes, for cover of a box compared with the box itself.

Have children measure each other, measure the growth of twigs, make com-

parisons in weights and measures. Arithmetic of a very practical kind is found in nature study, manual training, and in sewing and cooking. Boys and girls in industrial courses must measure and weigh with accuracy and skill.

Construction work when properly taught affords the finest mental discipline. Let children work out their own knowledge and make them personally responsible for their own results. Encourage them to tell what they know in free conversation. Such free work is far more valuable than formal recitation.

**Text-Book.**—A text-book is usually placed in the hands of pupils as early as the second half of the third year. From this time on the teacher follows the outlined course of study. Each year she must see to it the class thoroughly reviews the essential features of the preceding year's work and that such forward steps as are marked out for her grade be intelligently taken. Each year the work involves more difficult combinations and more complicated processes. The exact groundwork to be covered grade by grade differs in different schools according to the course of study outlined by different boards of education, but everywhere the essentials of class work are the same.

**Class Work.**—Cultivate the habit of first grasping the conditions of a problem, what is given, what is required, the relations between the two, the solution. Dictate original problems. Call for restatement of facts and conditions. Let pupil state process without solving. Dictate work slowly and distinctly without repeating. Demand close and lively attention. Call for original problems to illustrate principles. Secure familiarity with arithmetical facts and accuracy and ease of language. Typical problems, from Professor Smith's *Monograph*, to which this article is already under great obligations, have been borrowed here to show the nature of original work that may be done in different grades.

**Two Groups of Problems Given to a Third-Year Class.**—

**Oral Exercise** (without pencil and paper).—

1. The coffee for our breakfast cost 6c, the potatoes 4c, the meat 32c, and the bread 4c. How much did the bread and meat cost? How much did the food cost?
2. The oatmeal for a breakfast cost 8c, the milk 4c, the fruit 10c, the rolls and butter 5c, and the eggs 8c. How much did this food cost?
3. For a dinner the meat cost 30c, the vegetables 20c, the dessert 20c, the coffee 15c, and the other food 15c. Find the total cost.

4. The meals for a small family cost \$1.70 on one day and \$2.20 on another day. How much did they cost for these two days?

**Written Exercise.**—The load is one of man's best friends. One toad will keep a garden of 800 sq. ft. free from harmful insects.

1. At this rate, how many toads would protect from insects a garden 80 ft. wide and 100 ft. long?

2. The eggs of four toads were counted and found to be 7,547, 11,540, 7,927, and 9,536. How many were there in all?

3. If one out of 50 hatched, how many hatched? (Divide all by 50.) If 715 of these were destroyed by other animals, how many survived?

4. If each of these survivors destroys insects that would cause \$10 worth of damage, how much are they all worth to a village?



**Typical Problems for the Fourth or Fifth Grades.**—1. Sarah's mother bought  $4\frac{1}{2}$  yds. of cloth for a coat, at \$1.25 a yd. What did she pay for it?

2. She also bought  $3\frac{1}{2}$  yds. of lining at 50¢ a yd. and  $4\frac{1}{2}$  yds. of braid at 20¢ a yd. How much did these cost?

3. She also bought 6 pearl buttons at \$1.50 a dozen, and 2 spools of silk at 8¢ a spool. How much did these cost?

4. A dressmaker charged \$5 for making the coat. What did the materials and making cost?

**Typical Problems for the Sixth or Seventh Grades.**—1. The following is, by weight, a good mixture of seed for a pasture: Kentucky blue grass 25%, white clover  $12\frac{1}{2}\%$ , perennial rye  $28\frac{1}{2}\%$ , red fescue  $\frac{3}{4}\%$ , reitrop 25%. At 32 lbs. to the acre, how many pounds of each are used?

2. A farmer puts 5 acres into celery, setting out 20,000 to the acre. The yield being 1,500 heads to the acre, what is the ratio of the plants matured to the others?

3. He pays \$85 an acre for seed, fertilizer, labor, and other expenses, and sells the crop at 15¢ a dozen heads. What is his profit on the 5 acres?

An outline of the course in arithmetic in the eighth school year in Munich will show how the German schools are working out some practical ideas for girls who are soon to be the home makers. It is more complete than anything we have yet worked out in America.

The work for the year is as follows: 1. Simple domestic bookkeeping. 2. Calculation of the prices of foods, bought in large or in small quantities, together with the question of discounts. 3. Cost of meals for the home. 4. Daily, monthly, and yearly supplies for the kitchen.

Too much importance cannot be placed upon the nature of the original problems. They enliven class interest and give ample opportunity for correlation with other school subjects and with the livelier interests of the social environment. They should strain the powers of the child to think and compute, but they should not be too hard for him to master them independently. In every way problems should

help the teacher to make school work practical.

**Summary of Suggestions for the Teacher of Arithmetic.**—1. There are a few things primarily essential in arithmetic that should be learned by every child. He should think in numbers as readily as he thinks in other subjects. He should be ready to execute his thought with quickness and precision.

2. Drill and repetition for accuracy and speed should be given day after day that the child may early master the mechanical difficulties of the subject, but drill should not become a lifeless mechanical repetition; it should be so varied as to produce thought and animation.

3. Such processes as addition, subtraction, multiplication, and division should be mastered early. Often much time is wasted in the upper grades learning facts and processes that should have been mastered in the lower grades when the child is passing through the stage in which this work can be done most easily.

4. The introduction of too many topics at a time should be avoided. The pupil should be required to meet but one difficulty at a time.

5. Begin with the concrete, then drill on number facts and processes. In the primary grades teach number facts for the most part in connection with the study of other subjects. Use material drawn from the number side of school experience and the simpler and more evident relation of home life. The continued use of any particular set of objects is tiresome and narrowing.

6. It is important to use objects freely whenever they assist in understanding number relations, but care should be taken not to fetter the mind with objects when it is ready for the abstract. Pass from observation to reasoning, from concrete to abstract, from facts to principles, from particular to general, and, very slowly, from the simple to the complex. The child passes through the stage of objects to that of representation of objects, to that of symbols. Noticeable progress begins when he can think of things not present to his senses.

7. In the intermediate grades emphasis should be laid upon the scientific aspects of the work, that is, rules and principles, in order to secure mastery of fundamental operations of numbers.

8. In the grammar grades considerable attention should be paid to the use of numbers in connection with the commercial and industrial activities of the community. Practical problems for all grades should be taken from industrial life.

9. In the working out of problems the child should be taught from the beginning to determine for himself the approximate results, appeal being made to the common sense check "Is this result reasonable?" "Does it agree with the conditions?"

10. Problems of graded difficulty should be given in all classes in order that even the weakest pupil may find enough that he can do to keep him trying. The exercise should bring in all the primary combinations of numbers and all the fundamental processes. The tendency to overuse a few combinations at the expense of others must be guarded against.

11. The teacher must exercise judgment as to the amount of written work. Oral expression should always precede written. In primary grades number work is largely given orally—good, clear, well worded expression. A little work well done is much better than a large amount of work over-hurried.

12. Insist upon neatness and a proper statement of steps taken.

13. Accuracy, facility, orderly arrangement, self-reliance, are cardinal virtues in number work.

14. In the assignment of work, assign some purely for drill and some purely to train the reasoning powers. If reasoning is difficult, mechanical processes should be simple.

15. Aim to obtain efficiency through the discipline of numbers. "The prime desideratum," it has been said, "is the ability to work accurately, with reasonable rapidity and with interest, and to know how to apply numbers to the ordinary affairs of life." There is moral value in the integrity of numbers that "cannot lie."

## PRACTICAL HELPS IN ARITHMETIC

### ADDITION AND SUBTRACTION

The following plan is suggested in teaching the combinations in addition and subtraction:

1. Add 1 to every number up to 10; later to 20.

2. Subtract 1 from every number up to 10; later to 20.

3. Add 2 to 1, 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, 7 to 7, 8 to 8, 9 to 9.

4. Add 3 to 1, 4 to 2, 5 to 3, 6 to 4, 7 to 5, 8 to 6, 9 to 7.

5. Add 4 to 1, 5 to 2, 6 to 3, 7 to 4, 8 to 5, 9 to 6.

6. Add 5 to 1, 6 to 2, 7 to 3, 8 to 4, 9 to 5.

7. Add 6 to 1, 7 to 2, 8 to 3, 9 to 4.

8. Add 7 to 1, 8 to 2, 9 to 3.

9. Add 8 to 1, 9 to 2.

10. Add 9 to 1.

11. Add 10 to 0.

12. Teach the corresponding subtractions.

13. Review and give combinations not taught above.

**Note.**—Objects should be grouped by tens and units, in showing numbers above 10. The numbers written should represent objects counted.

### The Forty-Five Facts of Addition

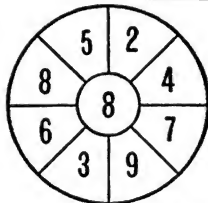
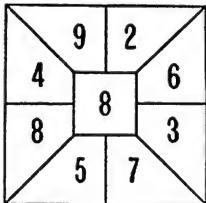
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18
10	11	12	13	14	15	16	17	18	19
11	12	13	14	15	16	17	18	19	20
12	13	14	15	16	17	18	19	20	21
13	14	15	16	17	18	19	20	21	22
14	15	16	17	18	19	20	21	22	23
15	16	17	18	19	20	21	22	23	24
16	17	18	19	20	21	22	23	24	25
17	18	19	20	21	22	23	24	25	26
18	19	20	21	22	23	24	25	26	27
19	20	21	22	23	24	25	26	27	28
20	21	22	23	24	25	26	27	28	29
21	22	23	24	25	26	27	28	29	30
22	23	24	25	26	27	28	29	30	31
23	24	25	26	27	28	29	30	31	32
24	25	26	27	28	29	30	31	32	33
25	26	27	28	29	30	31	32	33	34
26	27	28	29	30	31	32	33	34	35
27	28	29	30	31	32	33	34	35	36
28	29	30	31	32	33	34	35	36	37
29	30	31	32	33	34	35	36	37	38
30	31	32	33	34	35	36	37	38	39
31	32	33	34	35	36	37	38	39	40
32	33	34	35	36	37	38	39	40	41
33	34	35	36	37	38	39	40	41	42
34	35	36	37	38	39	40	41	42	43
35	36	37	38	39	40	41	42	43	44
36	37	38	39	40	41	42	43	44	45

**Note.**—Be sure that the nine facts underscored are thoroughly learned. They give most trouble.

## Drills in Addition

Draw on a sheet of paper a large square and a circle. Divide them like these. Put, say the figure 8, in the center with the other numbers around it.

Write any figure in the center where the 8 is. Then drill, by pointing to the figures around it, while the child names at once the sum of the center figure and the one pointed at.



Use exercises like this frequently, and give many problems, using the combinations with which you find the child has difficulty.

Exercises in which the child counts by 2's, by 3's, etc., to 100 are valuable.

## Proving Addition

You may early teach how to prove an addition. There are a number of ways of doing this. Use the way the child's teacher uses. It is a good way.

## One Way

Add the columns down. If the result is the same as when the columns were added up, the result is correct.

## Second Way

Write the numbers in two groups. Find the sum of each group. Add the sums of the two groups. If the result is the same as when the numbers were added in one group, the result is correct.

## Illustration of second way:

$$\begin{array}{r} 273 \\ 456 \\ \hline 729 \end{array} \quad \begin{array}{r} 273 \\ 456 \\ \hline 729 \end{array}$$

$$\begin{array}{r} 629 \\ 384 \\ \hline 1013 \end{array} \quad \begin{array}{r} 629 \\ 384 \\ \hline 1013 \end{array}$$

$$\begin{array}{r} 1742 \\ 31225 \\ \hline 32967 \end{array}$$

$$\begin{array}{r} 1742 \\ 31225 \\ \hline 32967 \end{array}$$

This is a modification of the plan called *casting out the nines*.

## Illustration

$$\begin{array}{r} 7020-24-6 \\ 4356-18-9 \\ 1824-15-6 \\ 9263-20-2 \\ 7856-26-8 \\ \hline 31225-13-4 \end{array} \quad \begin{array}{r} 7020-24-6 \\ 4356-18-9 \\ 1824-15-6 \\ 9263-20-2 \\ 7856-26-8 \\ \hline 31225-13-4 \end{array} \quad \begin{array}{r} 7020-24-6 \\ 4356-18-9 \\ 1824-15-6 \\ 9263-20-2 \\ 7856-26-8 \\ \hline 31225-13-4 \end{array}$$

## Explanation

First add the columns in the regular way. Add each column horizontally, left to right. The results are 24, 18, 15, etc. Add these horizontally and you have 6, 9, 6, etc.

You have now reduced all to one column. Take the sum of this column. It is 31. This added horizontally is 4.

Add the sum 31225 horizontally until you have but one figure in it and you also have 4. This proves your answer correct.

## Another Illustration

This illustrates where it is necessary to carry the horizontal additions a step further:

$$\begin{array}{r} 996745-39-12-3 \\ 728324-34-6-6 \\ 916349-31-4-4 \\ 929773-39-12-3 \\ \hline 3622390-25-7-7 \end{array} \quad \begin{array}{r} 996745-39-12-3 \\ 728324-34-6-6 \\ 916349-31-4-4 \\ 929773-39-12-3 \\ \hline 3622390-25-7-7 \end{array} \quad \begin{array}{r} 996745-39-12-3 \\ 728324-34-6-6 \\ 916349-31-4-4 \\ 929773-39-12-3 \\ \hline 3622390-25-7-7 \end{array}$$

Note.—With some practice it will be necessary to write the last line of figures only.

## Rapid Adding Exercises

When pupils have learned to add they quickly acquire skill by an occasional rapid adding exercise. A few minutes serves the purpose.

It may be made competitive by each pupil writing the numbers and at a given signal beginning the addition.

Slow and correct work is preferable to rapid work that is incorrect. Incorrect work is of no value here.

## Civil Service Method of Adding

Employees under the civil service bureau, bank clerks, and others who perform additions while surrounded by people engaged in conversation, use the following method in their additions.

This method is safe because one can detect and change an error very quickly.

\$5290	10
9760.50	19
349	21
4006.75	23
6522.89	18
132.12	24
	\$20,061.26

## The Banker's Method of Adding

This method is the same as that used by the civil service employees, with one change. In adding the columns the number carried is "added in" to each partial sum.

\$5290	10
9760.50	23
349	21
4006.75	25
6522.89	28
132.12	26
	\$20,061.26

The banker's method is an improvement on the civil service method as it does not require a second addition. The number to be carried is always in sight in the banker's method, being the tens figure of the last partial sum written. The sum can be written at once.

## SUBTRACTION

The differences of all these combinations should be learned so thoroughly that the pupil will be able to name difference of any combination at sight. This will take time, but it is time well spent.

Use devices similar to those used in the drills on the addition table.

Give many problems for oral work. Let the pupil make many problems and give the difference in each case.

## Combinations in Subtraction

1	2	3	4	5	6	7	8	9	10
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-2	3	4	5	6	7	8	9	10	11
-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
3	4	5	6	7	8	9	10	11	12
-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
4	5	6	7	8	9	10	11	12	13
-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
5	6	7	8	9	10	11	12	13	14
-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
6	7	8	9	10	11	12	13	14	15
-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
7	8	9	10	11	12	13	14	15	16
-7	-7	-7	-7	-7	-7	-7	-7	-7	-7
8	9	10	11	12	13	14	15	16	17
-8	-8	-8	-8	-8	-8	-8	-8	-8	-8
9	10	11	12	13	14	15	16	17	18
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
10	11	12	13	14	15	16	17	18	19
-10	-10	-10	-10	-10	-10	-10	-10	-10	-10

## The Computer's Method

In making change, the method below is nearly always used. Computers find it the more practical way. It gives greater rapidity and accuracy than the other method.

Many of the best teachers use it alone in teaching subtraction.

This plan is called the Austrian method by some.

## Example

Find the difference between 725 and 432.

## Work:

725

432

293

293

293

293

293

293

293

293

293

293

293

293

293

293

293

293

293

293

Use that method with these examples:—

42,238	2934	7925	8743
-17,345	-1469	-1504	-1428
35,091	678	6771	4818

Note.—With practice the pupil will come to prefer this method and should be helped in its use. It is practical since conducive to both rapidity and accuracy.

## Proofs of Subtraction

To prove a subtraction add the subtrahend to the remainder. The result will be the minuend if the work is correct.

<i>Example</i>	<i>Proof</i>
435 minuend	173
— 173 subtrahend	333
262 remainder	425

425 is the same as the minuend, hence the work is correct.

## Another Proof

Take the remainder from the minuend. If the work is correct the subtrahend will be left.

If in the last example given we write  
435  
— 262

we get 173, which is the subtrahend used above, hence the work is correct.

Note.—Either proof may be used. Show the child why these two proofs are true. Use small numbers to do this like 7—2. Later use larger ones.

## NUMBER STORIES IN MULTIPLICATION

## Example

3 X 4 = —

## Facts Given by Child

3 X 4 means 3 4's.

I count my blocks by fours—I take 1 four, another, another.

I find that 3 4's are 12.

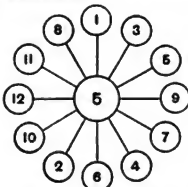
3 X 4 = 12.

## To the Teacher

Now the child is ready to give a number story about 3 X 4.

Note.—If the pupil is in doubt about any part of the work in number stories, he should use objects, and then practice much without them.

## Drills in Multiplication



The drill opposite is very good and effective, if a rapid answering exercise is made of it. Products should be given at once.

To vary it use squares.

Draw a diagram like this one and let the pupil fill in the squares with the proper products. Fix a time limit. Have results put in quickly.

1	2	3	4	5	6	7	8	9
2								
3								
4						28		
5								
6								
7						42		
8								
9								
10								

$$\begin{array}{r} 4 \times 1 = 4 \\ 4 \times 2 = 8 \\ 4 \times 3 = 12 \end{array}$$

$$\begin{array}{r} 7 \times 1 = 7 \\ 7 \times 2 = 14 \\ 7 \times 3 = 21 \end{array}$$

Make diagrams like these,

and let the pupils fill them in.

In this work it is not intended that the pupil should at first learn "his tables" in order, the 2's first, then the 3's, then the 4's, etc. He remembers many of the facts of multiplication from his primary work in numbers. These drills are to complete and fix firmly in the pupil's mind the completed multiplication tables.

## Proofs in Multiplication

## The Multiplication

$$\begin{array}{r} 43 \\ \times 25 \\ \hline 215 \\ 860 \\ \hline 1065 \end{array}$$

## The Proof

$$\begin{array}{r} 25 \\ \times 43 \\ \hline 75 \\ 1000 \\ \hline 1065 \end{array}$$

The proof consists merely in reversing the positions of the multiplicand and multiplier, and performing the multiplication in the usual way. If the product is the same in both cases the work is correct.

## PRIMARY IDEAS OF DIVISION

In teaching the two ideas of division—division by measurement (division proper) and the fractional idea of division (partition)—proceed very slowly and see that each step is thoroughly understood.

The following suggestions may be useful:—

## Division by Measurement

Use colored blocks or any other counters in illustrating the process.

## Example

$$4 \overline{) 12}$$

The teacher should ask the child, "How would you count this story?"

## Facts Given by Child

12 = whole number of blocks.

4 = number in each part.

We want to know the number of parts.

We place the blocks so, 4 in each part:—



There are 3 parts.

## Division by Partition

Make use of colored blocks or substitutes to show the process here.

## Example

$$\frac{1}{4} \text{ of } 12 = 3$$

The teacher should ask the child, "How would you count this story?"

## Facts Given by Child

12 = whole number of blocks.

4 = number of parts.

We want to know the number in each part.

We place the blocks so, as we know there are 4 parts:—



We have put one in each part.

Now we will put one in each part until the 12 blocks are gone:—



There are 3 in each part.

## The Three Uses of Division

## First Use Explained (Partition)

What is  $\frac{1}{4}$  of 24 cents?

Here 24 cents is the sum of money to be divided. It is to be divided by

4. The result shows the size of each part.

Number of equal parts 4) 24¢ money to be divided.

6¢ size of each part.

**Second Use Explained (Division by Measurement)**

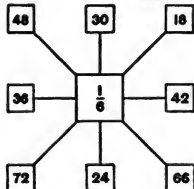
How many times is 8 cents contained in 32 cents?  
Here 32 cents is the sum of money to be divided. The size of each part is 8 cents, and the result gives the number of equal parts.  
Size of each part 8c. Size money to be divided.

**4 number of equal parts.****Third Use Explained (Ratio Idea)**

There are 36 acres in one lot and 9 acres in another. The first lot is how many times as large as the second?

From division we know that 36 acres contains 9 acres 4 times. Then 36 acres is 4 times as large as 9 acres; or, 36 acres is to 9 acres as 4 is to 1 acre.

Note.—This on the ratio idea leaves the impression that the other work does not embrace the ratio principle. Any comparison of numbers embraces the ratio idea.

**Division Drills**

It is well to use drills of different kinds to help fix the facts of the division table in mind. At no time, at this stage, are you sure that the pupil remembers from one day to the next.

Diagram drills are given here as suggestive of what may be made use of. Use other numbers in order to get drill on the whole division table.

Be sure to make the drill work brisk and of short duration.

**The Drill**

The teacher points to any of the numbers in the small squares and the child answers simply the quotient number. Skip about rapidly. Draw the same diagram on the blackboard and frequently change the fraction in the center square.

Allow no "thinking out" of results. The child should have the table at his tongue's end.

Change center fraction repeatedly.

The supreme test of his mental activity is to think quickly and tell correctly.

**Proofs in Division**

The best way to prove work in division is to multiply the quotient by the divisor and add the remainder, if there is one.

The result will equal the dividend if the work is correct.

Divide 600,181 by 937.

Work	
600,181	
937	
<hr/>	
640	683
907,000,181	
640	683
3790	
3748	
401	

**Proof**

640
937
683
4450
1990
8700
39900
401
600181

**READING NUMBERS**

When we spell a word, that is, when we read the letters in the word, we read from left to right.

To read a number we do the same thing for we read the figures from left to right.

The number is read differently if we wish to tell the place and value of a certain figure, for then we read the figures themselves from right to left.

325 means 3 units, 2 tens, 3 hundreds.

Never use "AND" in reading whole numbers.

325 should never be read "three hundred and twenty-five," but "three hundred twenty-five."

Numbers between 100 and 1000 are read by naming the hundreds, tens, and units in succession. Thus—

192—one hundred ninety-two.

652—six hundred fifty-two.

207—two hundred seven.

Above 1000

Read 1,902,632.

Here the 2 represents 1's, or units of the first order.

the 3 represents 10's, or units of the second order.

the 6 represents 100's, or units of the third order.

the 2 represents 1000's, or units of the fourth order.

the 9 represents 10000's, or units of the sixth order, etc., etc.

The order of any figure is the number of its place, starting from the right.

In reading large numbers we arrange the orders into groups of three figures each.

We call each group a period. Commas are used to keep the periods separate.

Names of the Periods					
units,	billions,	quintillions,	octillions,	nonillions,	units
thousands,	trillions,	trillions,	trillions,	trillions,	
trillions,	billions,	millions,	thousands,	units	
225,	967,	307,	472,	399,	

**FACTS ABOUT ROMAN NUMERALS**

The following facts about the origin and development of Roman notation can be made very interesting, and will tend to fix the characters in one's mind—

At first one was written I,

two was written II,

three was written III,

four was written IIII,

five was written IIIII,

six was written IIII I,

seven was written IIII II,

eight was written IIII III,

nine was written IIII IIII.

It took too long to make ten marks, and too long to count them after they were made, so one mark with another across it was used to denote 10, thus X.

The upper or first half of the X, or V, was used to show 5.

At first twenty was written XXX,

thirty was written XXXI,

forty was written XXXII,

fifty was written XXXIII,

sixty was written XXXIII I,

seventy was written XXXIII II,

eighty was written XXXIII III,

ninety was written XXXIII IIII.

It took too long to make the crosses and too long to count them in reading, so L was used to show 50. Half of the E or L was used to show 50. The L gradually became C in trying to make the E rapidly.

Write these where the child can see them plainly

I = 1	XX = 20	XXXIX = 39
II = 2	XXI = 21	XLI = 41
III = 3	XXII = 22	XLII = 42
IV = 4	XXIII = 23	XLIII = 43
V = 5	XXIV = 24	XLIV = 44
VI = 6	XXV = 25	XLV = 45
VII = 7	XXVI = 26	XLVI = 46
VIII = 8	XXVII = 27	XLVII = 47
IX = 9	XXVIII = 28	XLVIII = 48
X = 10	XXIX = 29	XLIX = 49
XI = 11	XXX = 30	L = 50
XII = 12	XXXI = 31	LX = 60
XIII = 13	XXXII = 32	LXI = 61
XIV = 14	XXXIII = 33	LXII = 62
XV = 15	XXXIV = 34	LXIII = 63
XVI = 16	XXXV = 35	LXIV = 64
XVII = 17	XXXVI = 36	LXV = 65
XVIII = 18	XXXVII = 37	LXVI = 66
XIX = 19	XXXVIII = 38	LXVII = 67
	XXXIX = 39	LXVIII = 68
		LXIX = 69
		LXX = 70
		LXXI = 71
		LXXII = 72
		LXXIII = 73
		LXXIV = 74
		LXXV = 75
		LXXVI = 76
		LXXVII = 77
		LXXVIII = 78
		LXXIX = 79
		LXXX = 80
		LXXXI = 81
		LXXXII = 82
		LXXXIII = 83
		LXXXIV = 84
		LXXXV = 85
		LXXXVI = 86
		LXXXVII = 87
		LXXXVIII = 88
		LXXXIX = 89
		LXXXX = 90
		LXXXXI = 91
		LXXXXII = 92
		LXXXXIII = 93
		LXXXXIV = 94
		LXXXXV = 95
		LXXXXVI = 96
		LXXXXVII = 97
		LXXXXVIII = 98
		LXXXXIX = 99
		LXXXXX = 100

**PRIME NUMBERS**

Some numbers, like 3, 5, 11, etc., can only be divided by themselves and unity. As they cannot otherwise be factored, we call them prime numbers.

**Prime Numbers from 1 to 1000**

(Use This Table for Reference)

1	59	139	233	337	439	537	633	709	883
2	61	149	239	347	443	543	639	713	887
3	67	151	241	349	449	549	643	717	897
5	71	157	251	353	457	571	673	797	911
7	73	163	257	359	461	577	677	799	919
11	79	167	263	367	463	581	683	811	929
13	83	173	269	373	467	589	691	821	937
17	89	179	271	379	479	599	701	823	941
19	97	181	277	383	487	601	709	827	947
23	101	191	281	389	491	607	719	839	953
29	103	193	283	397	493	613	727	839	957
31	107	197	293	401	503	617	733	853	971
37	109	199	307	409	509	619	739	857	977
41	113	211	311	413	517	631	743	859	983
43	127	223	313	421	523	641	751	863	991
47	131	227	317	431	541	643	757	877	997
53	137	229	331	433	547	647	761	881	

**SIMPLE MEASURES—For the Child to Learn Objectively**

- 2 pints make 1 quart.
- 8 quarts make 1 peck.
- 4 pecks make 1 bushel.
- 7 days make 1 week.\*
- 16 ounces make 1 pound.
- 12 inches make 1 foot.
- 3 feet make 1 yard.
- 12 things make 1 dozen.
- 5 cents make 1 nickel.
- 10 cents make 1 dime.

**LONG MEASURE**

Teach the child to estimate distances and then to verify every estimate by actual measurement.

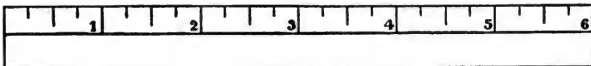
Teach half inches as well as inches.

**For the Child to Do**

1. Cut a strip of paper 12 inches long and 1 inch wide.
2. Mark the inches on it.
3. How many inches long is it?
4. What do you call a measure 12 inches long?
5. Draw a line 2 inches long, as near as you can, without using a ruler.
6. Measure it with a ruler. Did you guess nearly right? Try again.
7. Measure this paper. How long is it? How wide?
8. Draw a line on the ground 1 yard long.
9.  $\frac{1}{2}$  of a foot is how many inches?
10. 1 yard is how many inches? What is measured by the yard?

\*Objectively so far as pointing it out on a calendar.

11. Ask your mother how many yards of cloth she needs for a dress.  
12. What is measured by the foot?  
13. How tall are you?



## PRIMARY IDEAS OF TIME

Turn to the paragraph on Roman numerals and note the facts about them. 60 minutes make 1 hour. 12 hours make 1 half day. 24 hours make 1 day.

A new day begins at midnight and lasts until next midnight.

One hour after midnight is 1 o'clock. 2 hours after midnight is 2 o'clock, and so on, until 12 o'clock at noon.

At noon one-half the day has gone and we begin the afternoon, which is the last half of the day.

One hour after noon is 1 o'clock, 2 hours after is 2 o'clock, etc.

If a person says he was at a certain place at 2 o'clock, he must say forenoon or afternoon, so we will know which half of the day he means. If it was 2 o'clock in the morning he would write 2 a. m., and if 2 o'clock in the afternoon, 2 p. m.

## How to Teach a Child to Tell Time

First—Teach him to tell the hour hand from the minute hand.

Next—Teach him when he first looks at the dial, to find the hour hand and then notice which Roman numeral it is nearest. This will tell about what time it is.

Then—Find the minute hand. The minute hand will tell exactly what time it is.

## To Illustrate

Take this clock. The hour hand is near the Roman numeral II, which stands for 2. Tell the child it is somewhere near two o'clock. The minute hand will tell how near.



It must always point to the XII before it is exactly the hour. If it is one numeral away from the XII, toward the left, it is 5 minutes of two. If it is two numerals away to the left, it is 10 minutes of two, etc. If it is one numeral away to the right, it is 5 minutes after two, etc. Proceed in this way and keep at it.



## LIQUID MEASURE



If you have quart and pint measures allow the child to empty water from one to the other.

On teaching the table of liquid measure proceed in this manner—

Here is a gill cup. I am going to fill it to see how many gills make a pint. Now I have poured one gill, now two, now three, now four. Is the pint cup full? How many gills in a pint?

Let us prove what you say by pouring the water back. One gill; two gills; three; four. Were we right then?

Let us write what we have just said and proved—

4 gills = 1 pint.

Proceed in this way with the other measures, only let the child do more of the work for himself.

## MONEY

Use actual coins in teaching money. Lessons on money should be given frequently after the first year of school life.

Begin by teaching the value of the cent and the nickel, then the dime, then the quarter, then the half-dollar, and then the dollar.

Make problems involving change. Develop the ability to make change rapidly. The child may have some money of his own and he should be taught

the comparative values of the coins. The correct method of making change follows.

- 10 cents make 1 dime.  
2 five-cent pieces make 1 dime.  
100 cents make 1 dollar.  
A quarter of a dollar = 25 cents.  
A half-dollar = 50 cents.

\$ means dollars and c means cents.  
A five-cent piece is called a nickel because it is made of nickel.  
A cent piece is made of copper.  
The other coins named are made of silver.

## HOW TO MAKE CHANGE

First—Name the cost of goods.

Then—Add enough money to make even money.

Last—Add the large coin.

## To Illustrate

I bought some cloth for 35c and gave the clerk 50c. Count my change.

How to count it—

35c for cloth

And 5c makes 40c (to make even money)

And 10c makes 50c.

## To Illustrate

I buy suspenders for 32c and give the clerk \$1. Count my change.

How to count it—

32c for suspenders

And 3c makes 35c

And 5c makes 40c

And 10c makes 50c

And 50c makes \$1

(to make even money)

Note.—Think of it in this way—32c, 35c, 40c, 50c, \$1.

## THE CALENDAR

1903 July 1903						
Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
First Quar. 1st 30th	2nd Quar. 9th	3rd Quar. 17th	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	Drop Moon 29th

7 days make 1 week.  
30 days make 1 month.

## Days of the Week Months of the Year

Sunday	January
Monday	February
Tuesday	March
Wednesday	April
Thursday	May
Friday	June
Saturday	July
	August
	September
	October
	November
	December

## SQUARE MEASURE

How long is each side of the figure opposite?

How many squares in the figure?

Because each square is one inch on each side, we call it a square inch.

How many square inches in the whole figure?

The number of squares is called the area.

4 square inches is the area of this figure.

1 SQUARE  
INCH

Show by a drawing how many square inches in a figure 3 in. wide and 9 in. long.  
 Its area is 27 square inches.  
 We need not always draw a figure to get the area.  
 You will notice that the length times the width will give the number of squares in the figure.  
 Find the area of a figure 9 in. long and 6 in. wide, without a drawing. What did you do? *Makes a rule.*  
 Cut out a piece of paper 1 in. wide and 4 in. long. Cut it into square inches. Place the cut squares so as to form a large square. How long is it now? How wide? (See section on weights and measures for advanced tables.)

## PRIMARY IDEAS CONCERNING DRY MEASURE



8 quarts make a peck (pk.).  
 4 pecks make a bushel (bu.).

Dry measure is sometimes used to measure dry articles. Formerly grains, vegetables, and fruit of all kinds were bought and sold by dry measure.  
 Don't teach the child, as most arithmetics say, that grains, fruits, and vegetables are bought and sold by the measured bushel. They are not.  
 The weight bushel, the case, and the box have come into common use for these articles.

Teach the names of the measures before you attempt to teach the number of one measure in another, etc.

## SIMPLE FRACTIONS

A very good method of teaching the combinations in small fractions is by the use of paper or cardboard disks. (Children may call them circles.)  
 Cut out a large number of them, and, in order to avoid trouble later on, it might be better to have the disks all of one size—about 6 inches in diameter.

Teaching the Fraction  $\frac{1}{2}$  with Disks

Say to the child:  
 I am going to cut this circle into two equal parts. What is this part called? What is this other part called? How many halves in the whole circle? One-half and one-half are what? One-half taken away from one leaves what? If I take a half (one time), what do I get? How many halves in a whole?

Now I will write these—

$$\frac{1}{2} + \frac{1}{2} = 1 \quad \text{1 divided by } \frac{1}{2} = 2$$

$$1 \text{ less } \frac{1}{2} = \frac{1}{2} \quad 1 + 2 = 3$$

$$2 \times \frac{1}{2} = 1 \quad 1 - \frac{1}{2} = \frac{1}{2}$$

Give me the answers and I will write them.

Drawings showing the "placing" of disks for number stories can be made by the child; as,

$$\frac{1}{2} + \frac{1}{2} = 1$$

$$\frac{1}{2} \div \frac{1}{2} = 2$$

Ask the child to make similar drawings to tell about halves.

Proceed like this—How many thirds in a pie? If a pie cost 10 cents, what will half a pie cost? Who can tell other stories about halves? etc.

Teach fourths along with halves.

Teaching the Fraction  $\frac{1}{3}$  with Disks

Cut several disks into thirds. Have the child practice on cutting, so that he will be able to make the three parts of each disk equal.



Then proceed like this—What do you call each of these parts? Why are they called thirds? How many thirds in a circle? I am going to take a circle and cut it any way, so as to make three parts; do I call these unequal parts thirds? Why not? Let me write one-third on a piece of paper for you. (Write,  $\frac{1}{3}$ .) Draw a circle for me. Instead of cutting it, draw lines where you would cut it to make thirds. Write one-third ( $\frac{1}{3}$ ) on each third of a circle. I write this ( $\frac{1}{3} + \frac{1}{3}$ ). Who can tell me what the answer is? Are two-thirds and two-thirds more than one? How much more? I have two-

thirds of an apple and give Mary one-third, how much have I left? Who can give other story problems about thirds? Everybody try, etc.

Teach sixths along with thirds. Use disks, dots, marks, sticks, and inches to illustrate.

Remember that no advance should be made until each little part is understood.

Teaching the Fraction  $\frac{1}{6}$  with Disks

Have fifths compared with fourths, thirds, and halves.

Be sure that the child sees that the number below the line shows the size of each part and the number above how many parts are taken.

Have the child illustrate every step with drawings. If at any time he cannot answer results at sight, let him show the work with disks.

Say to the child:

I am going to cut this circle into five equal parts. What is each part called? How many fifths in the whole circle? How many thirds here? (Show two-fifths.) One-fifth and one-fifth are how many fifths? One less two-fifths is what? If I take three-fifths, how many times one-fifth do I take? How many times one-fifth are left? Are two-fifths greater than one-third?

Give and ask for story problems and number stories telling about fifths.

Teach tenths along with fifths.

When twelfths are taught, show the relations between twelfths and sixths, fourths, thirds, and halves.

## Equal Fractions in Different Forms

Have the child see how fractions may differ in form but still remain the same in value.

Begin with his knowledge of smaller fractions, as,

$$\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \text{ and } \frac{4}{8} \text{ of an apple}$$

Let him show by the use of drawings that fractions may have large or small terms but be equal in value.

## Things for the Child to Do

Fill out the numerators in the following fractions and prove each by a drawing:—

$$1. \frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{8}{16}$$

$$2. \frac{1}{5} = \frac{2}{10} = \frac{3}{15} = \frac{4}{20}$$

$$3. \frac{1}{8} = \frac{2}{16} = \frac{3}{24} = \frac{4}{32}$$

$$4. \frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16}$$

$$5. \frac{2}{5} = \frac{4}{10} = \frac{6}{15} = \frac{8}{20}$$

## PRINCIPLES OF FRACTIONS

1. A fraction's value is the quotient obtained by dividing the numerator by the denominator.

$$\frac{6}{2} = 3 \quad 3 \text{ is the value of } \frac{6}{2}$$

$$\frac{2}{3} = \frac{2}{3} \quad \frac{2}{3} \text{ is the value of } \frac{2}{3}$$

2. Multiplying the denominator of a fraction divides the fraction by that number.

$$\frac{1}{2} \times 4 = \frac{1}{8} \quad \frac{3}{7} \times 3 = \frac{3}{21} \quad \frac{2}{3} \times 9 = \frac{2}{27}$$

3. Dividing the denominator of a fraction multiplies the fraction by that number.

$$\frac{3}{8} \div 4 = \frac{3}{2} \quad \frac{10}{9} \div 3 = \frac{10}{3} \quad \frac{3}{10} \div 5 = \frac{3}{2}$$

4. Multiplying the numerator of a fraction multiplies the fraction by that number.

$$\frac{2}{3} \times 2 = \frac{4}{3} \quad \frac{1}{6} \times 8 = \frac{8}{6} \quad \frac{5}{6} \times 3 = \frac{15}{6}$$

5. Dividing the numerator of a fraction divides the fraction by that number.

$$\frac{4}{7} \div 2 = \frac{2}{7} \quad \frac{12}{7} \div 12 = \frac{1}{7} \quad \frac{3}{7} \div 3 = \frac{1}{7}$$

6. Multiplying both numerator and denominator of a fraction by the same number does not change the value of the fraction.

$$\frac{1 \times 3}{3 \times 3} = \frac{3}{9} = \frac{1}{3} \quad \frac{6 \times 2}{7 \times 2} = \frac{12}{14} = \frac{6}{7}$$

7. Dividing both numerator and denominator of a fraction by the same number does not change the value of the fraction.

$$\frac{12 \div 3}{15 \div 3} = \frac{4}{5} = \frac{12}{15} \quad \frac{18 \div 9}{27 \div 9} = \frac{2}{3} = \frac{18}{27}$$

## NATURE STUDY AND ELEMENTARY AGRICULTURE.

—Elementary agriculture in the country schools should include the fundamental principles of agricultural practice, illustrated in large measure by such laboratory and field work as will be directly and immediately helpful and practical on the farms in the midst of which the school is located. Through the teaching of elementary agriculture in the country schools, the introduction of such needed reforms as seed improvement, improved culture of soils, and the checking of waste, is entirely practicable and possible. Since the country school term does not extend throughout the whole year, the work in agriculture cannot be very satisfactorily unified upon the basis of farm operations in season, yet there are certain topics best studied at each season of the year when first-hand contact with materials is possible. The following topics as outlined in Nolan's *One Hundred Lessons in Elementary Agriculture* suggest a course for a year's work.

**Topics for Autumn Months.**—1. Composition of soils. 2. Relation of soils to water. 3. Fertilizers. 4. Seeds and their germination. 5. Selecting and storing seed corn. 6. Tree planting. 7. Weeds. 8. Insects. 9. Fruits. 10. Pastures. 11. Agricultural clubs. 12. Storing fruits and grains for winter.

**Topics for Winter Months.**—1. Judging seed corn. 2. Elements of forestry. 3. The horse and its care. 4. The cow. 5. Milk and butter. 6. Sheep, hogs, poultry, etc. 7. Feeding and care of farm animals. 8. Comparative studies of agricultural products of various states. 9. Crop records and farm bookkeeping. 10. Roads, rural mail, parcels post, etc. 11. Farm machinery, fences, etc. 12. Farm buildings.

**Topics for Spring Months.**—1. Testing seed corn. 2. Hot-beds. 3. Gardening. 4. Cultural requirements for vegetables. 5. Beautifying home grounds. 6. Pruning. 7. Budding, grafting, etc. 8. Spraying for scale and codling moth. 9. Plowing, harrowing, and cultivating. 10. The potato crop. 11. Transplanting. 12. Valuable birds to agriculture. 13. Sowing farm crops.

In teaching the topics suggested above the aim should be to bring out the essential principles involved in the practice, and to lead the pupils to first-hand contact with the material in as many ways as possible. The country school-teacher should strive in each case to have the lesson tried out on the pupil's home farm. The aim of each lesson should be definite, to bring out and apply one single principle relating to the topic in hand.

An excellent method to unify and organize the work of elementary agriculture in the country schools is for the pupils and teacher to imagine that they have just purchased an unimproved forty acres of land, or perhaps better still, select a forty-acre field near the school grounds, and in theory manage it for one year. Require each pupil to provide a good permanent notebook and keep a record of every detail of procedure as the farm is selected, laid out, equipped with buildings, planted, cultivated, and managed throughout an imaginary year. The practices that would properly come next in point of time in the actual management of such a farm would furnish order and sequence for the topics of study and practical exercises through-

out the school course. In this method the pupil should be required to read all the farm papers, bulletins and books available, and keep a diary record of an imaginary year of actual farming.

Such a course in elementary agriculture could be well adapted to the seventh and eighth grades. Three recitations a week would be sufficient for introducing the subject, giving the last half hour of the school program to this subject.

### Suggested Lessons for School and Farm.

—The most helpful method of conducting experiments and developing the outlines that follow is to assign to a certain pupil or group of pupils the responsibility of working out the particular tests that are to be made. From parents, and from books and bulletins with which the school library is supplied, the children gather any and all information possible bearing upon the subjects under study. After free class discussion and much questioning of the pupils, the class and teacher should together work out a simple outline according to which the children will write the results of their study and observations in composition form. Some of these productions should be read in class; all errors both in fact and in English should be noted, but the compositions need not be rewritten. The sheets as first written can be put together in booklets with original designs covers. This disposition of the compositions furnishes excellent motive for careful and correct composition work and a basis for prize and competitive contests.

Alertness on the part of the teacher for the practical and everyday problems that are constantly presenting themselves to the intelligent farmer will keep an industrious teacher busy finding room for the discussion and solution of the problems in the time usually allotted to such subjects in the school program. It is well to carry with the course and experiments practical mathematical problems such as construction and capacity of cribs and silos; amount of rainfall; estimating quantity of seeds needed per acre for planting; judging corn; value of fertilizers needed for land; shrinking of corn in cribs; profit per acre on the different crops; return from one bushel of seeds, and many others that will suggest themselves to the teacher. (For problems in agricultural arithmetic write for extension bulletins published by Ohio State University Agricultural College, Columbus.)

There are the best of reasons why teachers, especially in the rural districts, should be interested in these agricultural problems as school exercises. First, the spread of the knowledge and practice of scientific agriculture has vast economical value in improving the products of American agriculture; second, the teaching of it in the rural schools exerts a strong influence toward interesting the parents in the permanent worth and importance of the school. The teacher who enters intellectually into the simple and practical exercises in agricultural nature study here suggested will not be long left in doubt as to the community's responsive interest in the school and its estimate of its social importance to the community. Children love to do things, especially things that are obviously useful; they need only judicial direction in order to turn their instincts into the various forms of self-education, which is the only kind of education that "sticks."

Special interest and profit result from

investigating the literature and different writings in which allusions are made to corn and wheat and relative subjects. Splendid use can be made of that part of Longfellow's *Huawakia* referring to Mondamin, with whom Hiawatha wrestled after the feast. To have a number of the pupils read a collection of such selections to the school and visitors Saturday afternoons makes a most interesting hour's exercise. Topics and practical tests can be made from the following outlines suited to the various grades. Perhaps the pupils of the first four or five grades may be too young to be taught the science of agriculture, but they are not too young to gain an abundance of knowledge along the line of nature study.

### Exercises on Soil.—How Soil Is Formed.

When the earth cooled it was composed of solid rock, upon which the water acted, changing or breaking it up into small particles. This was caused by the force of falling rain and hail and the expansion, by freezing, of the water in the small crevices of the rock.

Lichens then grew on the rocks and sand, obtaining their food from the air, and in their death and decay bacteria acted upon them, forming humus. Plants then grew on the sandy loam formed, and the roots, reaching down into the rocky crevices, split the rocks.

The soil and remaining rocks were then acted upon by oxidation, gravitation, wind, tides, animals, glaciers and earthquakes. All of these tended to break up and loosen the soil and prepare it for the action of water and carbonic acid, which dissolves the rock.

There are three distinct classes of soil—the alluvial, which has been brought from other places by streams; the sedimentary, which is the soil which was originally formed there; and the glacial, which was carried there by glaciers.

### I. To Show Retention of Water on Soil.

Materials.—Samples of clay, gravel, sand-loam, leaf mold; five glass bottles or fruit jars and five funnels.

Fill each funnel with a different kind of soil, same amount in each by weight. Tie a muslin cloth over the small end of each funnel to prevent the earth from washing through and place them over the jars. Pour an equal amount of water into each at the same time, note the soil that permits the water to pass through the fastest and the soil that retains the water the longest. Find how each soil ranks in its power to retain moisture. After two or three pourings weigh each funnel, and note the slight difference in weight; which soil retains the most water; which soil dries off the soonest after a heavy rain; which will be ready to plant first in spring; which soil will stand a very dry summer best.

### II. To Show Effect of Air on Soil.

Materials.—Two chalk boxes.

Fill one with loam, loosely packed. Fill the other box with clay or leaf mold, tightly packed. Plant the same kind of seed in each one and give both the same attention. In which does the plant seem to grow better?

### III. To Show the Advantage of Soil Foods or Fertilizers.

Materials.—Four chalk boxes or boxes slightly larger.

Fill each box with the same kind of soil. In No. 1 place a small quantity of stable fertilizer. In No. 2 a small quantity of high-grade commercial fertilizer. In No. 3 same quantity of cheap commercial fertilizer. In No. 4 omit fertilizer. Plant

same kind of seed in each box; cultivate all plants in each box by the same method. Notice the difference between the plants that receive the fertilizers and those that do not.

**Outline for the Further Study of Soil, With Test Questions and Sources.**—

- (a) Origin and tillage of soil.
- (b) Moisture and drainage of soil.
- (c) Fertilization and improvement of soil.
- (d) Adaptation to vegetation.
- (e) Effect of wind upon soil.
- (f) Study of properties of soil.
- (g) Renovation of worn-out soil.
- (h) Alkali lands.

**Questions.**—1. What is soil?

2. What is subsoil?
3. How is soil formed?
4. What is humus?
5. How does the earthworm influence soil?
6. Why should soil be plowed before corn is planted?
7. Why should crops be well cultivated?
8. Name three plants that improve soil. How?
9. What is meant by rotation of crops?
10. How are the following produced?

Sinking coasts, rising coasts, earthquakes, volcanoes, natural bridges, lakes, cataraacts, oxbow loops, deltas, glaciers, coral reefs, coal gas, oil, deserts, tundras, and estuaries. (See U. S. bulletin No. 257.)

**Sources and Summary of Bulletins Needed.**—U. S. farmers' bulletins Nos. 77, 245, 257, 262. (See list.)

**Exercises on Plants.**—It is assumed that the pupils who are to take up elementary agriculture have had some nature study work, and in this way have learned something of the structure of common plants—that is, they know the names and understand to some extent the functions of their essential parts: roots and stems, leaves and flowers, including the reproductive organs, stamens, pistils. When the pupils do not have such knowledge some time should be spent on these simple exercises in the study of plant anatomy.

**I. To Learn and to Find the Parts of the Flowers.**—Gather flowers that have all the parts, and with a sharp knife take each out and name. Cut a cross section of the cherry blossom and name the parts present.

**II. To Find Stamens and Pistils and to Compare Perfect and Imperfect Flowers.**—Perfect flowers have both stamens and pistils present. From a strawberry blossom point out these organs. Flowers having pistils only are imperfect flowers. Find such a blossom and compare it with a perfect flower. Will an imperfect flower produce fruit? What kind of a flower is found on Indian corn plant? Where are the stamens on the corn plant? The pistils?

**III. Roots and How They Get Their Food From the Soil.**—Materials—(1) A large mouthed bottle, a glass tube, an egg, some sealing wax and water. (2) Sawdust and a marble slab.

Plant food must be in liquid condition before it can be absorbed by the plant. The root structure of the plant is very intricate. There are little roots attached to the rootlets that are so small the naked eye cannot discern them. These are called root hairs and through them the plant receives its food. They are composed of a single cell filled with an albumi-

nous substance, called protoplasm, which is similar to the white of an egg.

As the covering of the cell is not porous in the ordinary sense of the word, the question arises as to how the liquid food enters the cell. This is accomplished by the principle of osmosis. It has been proved by scientists that if a dense liquid is separated from a less dense one by a thin membrane, they will flow together, the less dense fluid flowing into the more dense one in greater proportion than *vice versa*. This can be proved in the schoolroom with an egg, a glass tube, a large mouthed bottle, some water and some sealing wax.

The glass tube is inserted into the small end of the egg and sealed in place with the sealing wax. The shell of the large end of the egg is then broken off to expose the membrane, and the large end put into the water. The water and the white of the egg will, in the course of a few hours, flow up the tube.

After the liquid enters the root hair cell, it is carried up to the plant by means of capillary attraction, which is a power which tends to raise the water.

The root hairs of a root system can collect nourishment from the undissolved plant food by tending to dissolve it with an acid secreted in the membrane of the root hair. To prove this, cover a polished piece of marble with wet sawdust and plant a few seeds in it. The root hairs will sprout, and, when removed, the marble will be rough.

**IV. To Show That Plants Give Off Moisture and the Rise of Water in Plants.**—Materials—Crock or pot of earth containing a plant, a piece of cardboard, glass tumbler, and a piece of wax or tallow.

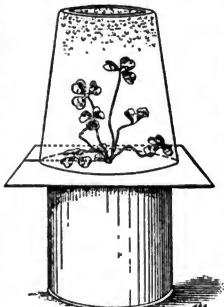


Figure to show that plants give off part of the moisture absorbed from the soil

Take a plant that is well started. Cut a slit in the cardboard and draw it around the plant. Seal the slit with wax or tallow so that no moisture can come up through it from below; cover the plant with the glass and set in a warm, sunny place. Moisture will condense on the inner surface of the glass. Where did the moisture come from? Does this experiment prove that water rises in plants?

**Why?** Cut a stalk of green corn or the stem of a geranium three or four inches above the ground. Observe the moisture that gathers on the point where the stalk was cut. Where did this moisture come from?

**V. To Show Root Development on Cuttings.**—Materials—Branches ten to twelve inches long taken from a willow tree; a glass jar.

Place these cuttings in a glass jar partly filled with water. Place the jar in a warm place and in about twenty or thirty days you will observe the roots formed on many different parts, especially house pot flowers.

**VI. To Prepare Soft Cuttings.**—Soft cuttings are sometimes made from leaves, but often from the stem. Insert the edge or a piece of a leaf in moist, warm sand; or lay the leaf, top side up, on the surface of the sand and fasten it down by running splinters through the veins in different places. Plants may spring up from the edges or at cut places in the leaf. In case of stem cutting secure thirty shoots from any strong herbaceous plant, such as the verbenas or geranium, and divide them into cuttings of at least two nodes and several leaves. Break off a part of some of the leaves to check evaporation. Pack the sand firmly around the cuttings and they will soon take root.

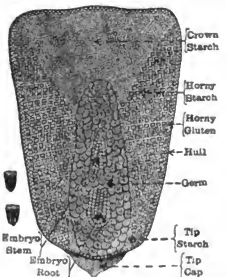


Figure showing parts and contents of grain of corn

**VII. To Learn to Test Seed Corn and Garden Seeds for Their Vitality.**—Prepare a germinating box about 10x12 inches and 3x5 inches in depth. Fill this box about half full of earth or sawdust. Moisten the earth and place over it a cloth of the same size as the box, first marking the cloth off in squares (checkerboard) of equal size, numbering each square. If there are 25 or 30 squares or sections on the ruled cloth, take as many seed ears as there are sections, numbering each ear to correspond with a section. Take from different parts of the ear, say eight grains. Place these eight grains in the section that corresponds with the number of the ear. After the grains have been properly placed in each section of the cloth, spread a second strip of cloth over the box so as to rest flat on the grains of corn. On the top of this cloth place moist soil in a sack. Observe the corn from day to day so as to examine the root hairs as well as the sprouts that come on the



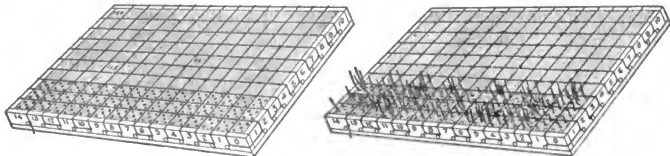
fertile grains. Find the per cent in each section that were fertile. Any ear making 85 or 90 per cent is good enough for seed. Those falling below 60 or 70 per cent should be discarded. This box should be kept in a place having about the same temperature as would naturally be the case out of doors in corn planting season. (See bulletin 409.)

5. What are tubercles? Legumes?
6. What legumes are used for food?
7. Why will corn usually grow well when planted in a clover sod?
8. After learning the food elements needed by each crop, indicate a good system of crop rotation for your vicinity.
9. What purpose do the root hairs serve the plant?

on the other. What caused the decay to appear? Why did the picked apple show no signs of decay? Why will a barrel of apples soon spoil if a few bad ones are in it?

**Outline for the Further Study of Fruit and How to Raise Fruit Trees and Test Questions and Sources.**—

- (a) Kinds of fruit.
- (b) Best soil for fruit trees.
- (c) Planting of fruit trees.



Seed-Testing Boxes

**VIII. To Learn How to Gather, Select and Care for Seed Corn.**—Have each pupil describe the method of selecting corn that is practiced by his father and neighbors. How do the methods mentioned in bulletin No. 299 compare with those practiced in your community? (See farmers' bulletins 299, 119.)

**IX. To Show Corn Mixing or Crossing.**—Materials.—White corn and yellow corn. Plant a small plot of white corn near a small plot of yellow corn. At husking time observe the kernels. How does corn mix? Explain in full. Plant a plot of sweet corn near some popcorn. Did it mix? Will it pop well? How are new varieties of corn or other plants started?

**X. To Learn What Seeds Are Scattered by the Wind.**—Have pupils collect and examine such seeds as those produced by the maple, box elder, elm, ash, dandelion, milkweed, thistle, parsnip, etc. Learn to recognize them wherever found.

**XI. To Learn What Seeds Are Scattered by Animals.**—Have pupils collect seeds or fruits from the Spanish needle plant, the burdock, sandburs, beggar lice, etc. What animals of the field scatter many of these weed seeds? How? Learn to recognize these seeds. In what other way are weed seeds scattered over the land?

**Outline for the Further Study of Plants With Test Questions and Sources.**—

- (a) How plants feed—from soil—air.
- (b) Root tubercles.
- (c) Kinds of roots.
- (d) Use of roots for food—for medicine.
- (e) Other uses of roots.
- (f) Pollination.
- (g) Crosses, hybrids—pollination.
- (h) Propagation.
- (i) Selecting good seeds.
- (j) Crop rotation.
- (k) Composition of plants.
- (l) Effect on climate.
- (m) Rank compared with other countries.
- (n) Poisonous plants.

**Questions.**—1. Explain how plants get food from the air—from the soil.

2. Why can an alfalfa plant stand more drought than clover?

3. Define tap, fibrous and fleshy, as applied to roots.

4. Define oemosis and give some of its uses in the plant kingdom.

10. What causes a tree to thicken about a wire that may be tied around it?
11. What is meant by pollination?
12. Would it be profitable for a fruit man to keep bees? Why?
13. What is cross pollination?
14. What is plant propagation?
15. What is the best method of selecting good seed corn? (Farmers' bulletin 199, 229.)
16. Learn to name and recognize about fifty weeds that grow in your neighborhood. (Farmers' bulletin No. 28.)
17. Explain the terms, annual, biennial, and perennial as applied to plants.
18. What is meant by purity and vitality as applied to seeds?
19. What are seed germinators?
20. Name twenty poisonous plants.

**Sources and Summary of Bulletins Needed.**—U. S. farmers' bulletins 339, 278, 188, 212, 240, 157, 199, 299, 28, 111, and 86. (In list.)

**Exercise on Fruit and How to Raise Fruit Trees.**—1. To Propagate by Tip Layering.—Materials.—A branch of black raspberry. The tip of a branch of black raspberry is bent over to the ground and covered with earth. It will soon take root and form a new plant. Pupils should try this several times and see how many new plants can be started from one old plant. (See U. S. bulletin No. 157.)

**II. To Propagate by Vine Layering.**—Materials.—A long branch of a grapevine. Bend it down flat on the ground and place it in a small trench in the ground. Cover it entirely over, and roots will put out at intervals and branches will come up through the ground. You can afterward cut the old vine between each new shoot and thus have several new plants. (See U. S. bulletin No. 157.)

**III. To Learn to Do Practical Grafting and Budding.**—(See farmers' bulletin No. 157.)

**IV. To Show Why Apples to Be Kept Over Winter Should Be Picked.**—Materials.—Three apples.

Take one that has fallen from the tree and received sufficient injury to break the skin, or break the skin with a stick. Secure another that is slightly bruised and one that is absolutely sound that has been picked. Put the apples away and note what takes place on the bruised part of the one, and where the skin was broken

(d) Care of fruit trees.

(e) Grafting.

(f) Budding.

(g) Pruning.

(h) Layering.

(i) Canning of fruit.

**Questions.**—1. What is the first step in tree planting?

2. Will the tree coming from the seed be like its parent?

3. What is grafting? Its purpose?

4. What is the scion? The stock?

5. When is the best time to make a graft?

6. Who was Luther Burbank? Learn all you can about this man.

7. Name several varieties of peach, pear, plum and apple trees.

8. What kind of each is usually planted in your community?

9. What fruits are usually raised by budding?

10. Explain the process of budding.

11. When can trees be budded or grafted upon one another?

12. How should a young tree be set in reference to the prevailing wind?

13. What are the principal objects of pruning a fruit tree?

14. When is the best time to prune to favor wood production? To induce fruitage?

15. Give a simple method of treating the stumps when large limbs have been removed by pruning.

16. Will a tree bear both wild and budded or grafted fruit at the same time?

17. What kind of soil is best for fruit?

18. How can a fruit tree be kept from making too rank a growth to produce good fruit?

19. Should orchards be pastured? Why?

20. Should fruit trees be cultivated?

21. Why will properly canned fruit not spoil?

22. What fruit is usually canned in tin? In glass?

23. Name ten varieties of apples and tell in what month they ripen.

**Sources and Summary of Bulletins Needed.**—U. S. farmers' bulletins 203, 198, 161, 154, 134, 113, 181 and 157. (See list.)

**Study of Plant Diseases and Their Prevention.**—Outline, Test Questions and Sources.

- (a) Cause and prevention.
- (b) Fruit molds.

- (c) Peach curl.
- (d) Club root.
- (e) Potato scab and blight.
- (f) Pear and apple fire blight
- (g) Smut of wheat and oats.

(h) Black knot.

**Sources and Summary of Bulletins Needed.**—U. S. bulletins Nos. 153, 250, 80, 127, 132, 16 and 259. (See list.)

**Farmer's Bulletins.**—The following is a list of valuable bulletins on practical subjects that should be a part of every rural school and farmer's library. These are alphabetically arranged for handy reference, and will be sent free to any address in the United States on application to any senator, representative or delegate in Congress or the Secretary of Agriculture, Washington D. C. Besides the U. S. bulletins here indicated, each state issues free bulletins on special methods, care and culture of crops peculiar to that state. To secure these, address the state secretary of agriculture at the capital city, or the state agricultural college. In writing for these state bulletins the writer should indicate the particular subject in which he is interested.

- No. 339. Alfalfa.
- No. 194. Alfalfa Seed.
- No. 263. Apple Diseases and Codling Moth in the Orchard.
- No. 61. Asparagus Culture.
- No. 18. Bean, The Soy, as a Forage Crop.
- No. 69. Bee Keeping.
- No. 62. Beet, The Sugar.
- No. 209. Boll Weevil in Cotton Seed and in Ginseng.
- No. 112. Bread and Bread Making.
- No. 241. Butter Making on the Farm.

- No. 131. Butter, Household Tests for Detection of Oleomargarine and Renovated
- No. 106. Cattle, Breeds of Dairy
- No. 152. Cattle, Scabies of
- No. 167. Cassava.
- No. 235. Concrete, Preparation of Cement
- No. 174. Corn, Broom
- No. 233. Corn, Germination of Seed
- No. 303. Corn Harvesting Machinery.
- No. 313. Corn, Harvesting and Storing.
- No. 220. Corn, The Production of Good Seed
- No. 290. Cotton Bollworm, The
- No. 201. Cream Separators on Western Farms.
- No. 318. Cowpeas.
- No. 231. Cucumber and Melon Diseases, Spraying for
- No. 349. Dairy Industry, The
- No. 330. Deer Farming in the United States.
- No. 345. Disinfectants.
- No. 64. Ducks and Geese.
- No. 52. Farm Animals, The Feeding of
- No. 126. Farm Buildings, Practical Suggestions for
- No. 347. Farm Equipment, The Repair of
- No. 242. Farming, Example of Model
- No. 270. Farm Home, Modern Conveniences for the
- No. 325. Farms in the Corn Belt, Small
- No. 187. Farm Land, Drainage of
- No. 228. Farm Management, Forest Planting.
- No. 62. Farm Products, Marketing
- No. 68. Farming, Suggestions to Southern
- No. 274. Flax Culture.
- No. 104. Frost, Notes on
- No. 168. Fruit Growers, Practical Suggestions for
- No. 203. Fruits, Preserves and Jellies, Canned
- No. 255. Garden, Home Vegetable
- No. 175. Grape Juice, Home Manufacture and Use of Unfermented
- No. 284. Grape East of the Rocky Mountains, Insect and Fungus Enemies
- No. 137. Goat, The Angora
- No. 185. Grounds, Beautifying the Home
- No. 24. Hog Cholera and Swine Plague.
- No. 272. Hog Farm and Seed Corn Farm, A Successful
- No. 331. Hogs in Kansas, Forage Crop for
- No. 100. Hog Raising in the South.
- No. 170. Horse Feeding, Principles of
- No. 179. Horsehoesing.
- No. 236. Incubation and Incubators.
- No. 127. Insecticides, Important

- No. 263. Irrigation, Practical Information for Beginners.
- No. 279. Johnson Grass, Method of Eradicating
- No. 192. Manure, Barnyard
- No. 66. Meadows and Pastures.
- No. 63. Milk, Care of, on the Farm.
- No. 206. Milk Fever and Its Treatment.
- No. 264. Moth, Brown-tail, and How to Control it.
- No. 304. Mushrooms, The Cultivation of
- No. 354. Onion Culture.
- No. 234. Pear, Canadian Field
- No. 205. Pig Management
- No. 140. Pineapple Growing.
- No. 56. Plants, Thorough Poisonous
- No. 137. Plants, The Propagation of
- No. 35. Potato Culture.
- No. 324. Potatoes, Sweet
- No. 335. Poultry and Dairy Farm, A Successful
- No. 182. Poultry as Food.
- No. 287. Poultry Management.
- No. 181. Pruning
- No. 164. Rape as a Forage Crop.
- No. 213. Raspberries.
- No. 207. Rats, Method of Destroying
- No. 338. Roads, Macadam
- No. 311. Roads, Sand Clay and Burnt Clay
- No. 321. Roads, The Use of Split-Log Drags on Earth.
- No. 49. Sheep Feeding.
- No. 98. Sheep Raising for Mutton.
- No. 292. Silos, Cost of Filling
- No. 32. Silos and Silages.
- No. 246. Sorghums, Sorghum for Forage.
- No. 147. Soils, Renovation of Worn-Out
- No. 275. Squab Raising.
- No. 198. Strawberries
- No. 135. Strip Manufacture, Sorghum
- No. 301. Tea, Home-Grown
- No. 196. Teas, Usefulness of the American
- No. 82. Tobacco, The Culture of
- No. 220. Tomatoes.
- No. 154. Tree Planting in Rural School Grounds.
- No. 351. Tuberculosis, Test of Cattle for
- No. 200. Turkey
- No. 199. Vegetable, Canning in the Home.
- No. 186. Vineyard, The Home
- No. 28. Weeds, How to Kill
- No. 132. Wheat, Insect Enemies of Growing
- No. 250. Wheat Smut and Loose Smut of Oats, The Prevention of



## SECONDARY EDUCATION

### A VIEW OF THE WORK OF HIGH SCHOOLS, ACADEMIES AND PREPARATORY SCHOOLS

**SECONDARY SCHOOLS.**—The secondary school system of the United States has developed out of the peculiar conditions of American life. It occupies a middle position between the elementary schools on one side and the colleges and higher technical schools on the other. The great majority of secondary schools are public institutions, supported by general taxation. A smaller number are private or endowed schools dependent upon tuition and upon private donations.

In each state the public school system, including the high schools, and in some cases, the state university, is under the control of state law. Our whole system of education is therefore a group of state systems, somewhat widely variant from one another yet containing some of the unifying elements of a general national system. According to the report of the national commissioner of education for 1908-9, 1,034,827 students were scheduled as attending secondary schools. Of this number 863,026 were in public high schools, and 171,801 in private secondary schools. During the nineteen years from 1889-90 to 1908-9, the number of secondary students in public high schools increased from 221,522 to 863,026, while the number of students in private secondary schools increased only from 145,481 to 171,801. Indeed the number of students in private secondary schools has fallen off several thousand in the last four years. During

the last twenty years there has been a corresponding improvement in the buildings and equipment of public high schools.

The following is the summary of the report of the commissioner of education for 1908-9 for the United States:

LIBRARIES		GROUNDS AND BUILDINGS		SCIENTIFIC APPARATUS	
Number of schools reporting	Volumes	Number of schools reporting	Value	Number of schools reporting	Value
8,676	5,143,121	8,671	\$223,847,479	7,117	\$13,777,153
MONEY VALUE OF ENDOWMENT			EXPENDITURE FOR SITES, BUILDINGS AND IMPROVEMENTS		
Number of schools reporting	Value	Number of schools reporting	Value	Number of schools reporting	Value
137	\$3,601,359		2,993		\$17,270,155

While this latest report is incomplete because some schools failed to report, it is quite sufficient to show that the American people have made a large financial investment in the public secondary schools. It is within the last twenty years that the remarkable expansion of the public secondary schools has taken place. The commissioner of education remarks further in his latest report "The rate of increase in the number of secondary students from

year to year is greater than the rate of increase in population. In 1890 the number of secondary students was 367,003, or about 5,900 to the million of population. In 1900 it was 9,500 to the million of population, and in 1909 about 11,700 to the million, or over 1 per cent of the population."

A historical examination of the schools of the United States would demonstrate that the public secondary school system, as we now have it, has sprung directly from the will and purpose of the common people. The free public high school is now generally recognized as a strong and important expression of American democ-

cracy. It is designed to offer to all children in the United States the full opportunity for higher education. In this respect it differs from other great secondary school systems in Europe.

The free secondary school is just beginning to take on its full importance and next to the elementary school is the most fundamental of American institutions. After the Revolution and until about 1850 the private and endowed academies

were the chief places for secondary schooling in the United States. But since 1850 the free public high school has developed rapidly in importance, till now it largely predominates. The first free secondary schools were established in Boston, Philadelphia, Baltimore and other eastern cities. Massachusetts and New York early established, by state law, systems of secondary schools under state control. Later, western states like Indiana, Minnesota, Michigan, and Wisconsin founded systems of secondary schools, with state universities to complete the comprehensive plan of state education. Such free high schools have been organized under local boards and are supported mainly by local taxation, but in the state systems the school funds of the whole state have been sometimes drawn upon for support of such schools. The free public high schools have had a stronger development in the middle west and in the far western states than in the east. But in recent years large public high schools have been founded in New York City and in other eastern cities where previously private secondary schools prevailed. In the eastern and southern states the private and endowed secondary schools still hold a relatively important place, but in recent years the public high school has developed with such rapid strides that it now leads in affairs of secondary education in all parts of the country.

Originally the high schools were not designed as fitting schools for colleges, but, somewhat in contrast to private schools preparing for college, the high school was to extend and expand the elementary school course for the benefit of the common people. The old private and endowed preparatory schools were somewhat aristocratic, while the high school is strictly a school of the people, and in more recent times it has been frequently called the people's college.

The tendency in the Mississippi valley states and farther west to establish state universities, sustained at public expense, as the completion of a free public school system for the people, made it necessary to establish a close connection between the high schools and the universities. Most of the middle and western states now have a state school system consisting of three closely related parts, the common school, the high school, and the university. All the states are now following more or less closely upon this plan. It was natural also that great public high schools should find it necessary to put themselves into close relation to the colleges and universities, because large numbers of high-school graduates would surely desire to go to college. Our present high schools are the result of a variety of historical forces. They are in the main locally controlled and supported, and stand very close to the common people. In many of the states the legislatures by state law have organized them into state systems. The state universities, also founded and controlled by the states, stand in close organic relation to the high schools. The secondary schools of the United States display wide variations and much lack of uniformity. The national government exercises no direct control over them, not even to the extent of requiring statistical returns. And yet the secondary schools are rapidly growing into uniformity. In spite of very important differences between the north and the south, between the extreme east and west, common in-

ences are at work throughout the whole country which are fixing common standards. Such are the state and national teachers' associations, organizations of secondary teachers and of college teachers, the reports of the national commissioner of education, the appointment of important committees from institutions in all parts of the country to report upon college entrance requirements, courses of study, the elective system, vocational training, and other special topics. Educational journals and literature tend also to propagate and unify important ideas in secondary education.

The ideal of the high school system is to put within reach of every child secondary training whether he lives in the city or country. High schools vary therefore in size and equipment from a rural school with not more than a dozen children to

a city school of four or five thousand students with corresponding equipment.

Our main purpose will be to describe somewhat fully the various courses of study offered in these schools, to outline briefly the content of the various branches to explain their value for purposes of general culture, and to point out their practical utilities when applied to actual life.

An examination of the course of study in one of our large city high schools shows that it consists of a group of courses serving several different ends. Some large city high schools have as many as twelve separate courses, e. g., the city of Los Angeles. The Hughes high school of Cincinnati has eight distinct courses, four of which are preparatory for colleges and professional schools, and four courses technical and industrial, and leading to vocations.

#### TYPICAL COURSES AS EXHIBITED BY THE CINCINNATI HIGH SCHOOL

**FIRST GROUP**—Academic courses for general culture and leading to colleges and professional schools.  
**SECOND GROUP**—Technical and industrial, and leading to vocations.

**ACADEMIC COURSES**—Elocution 1, Music 1, Gymnasium 2 periods a week, throughout the four years.

First Year			
GENERAL	CLASSICAL	DOMESTIC SCIENCE	MANUAL TRAINING
English.....4	English.....4	English.....4	English.....4
Algebra.....4	Algebra.....4	Algebra.....4	Geometry.....4
Latin or German (Adv.) or German (Beg.) } 5	Latin.....5	Latin or German (Adv.) or German (Beg.) } 5	Latin or German (Adv.) or German (Beg.) } 5
Botany or Zoology (1 double) } 5	Botany or Zoology (1 double) } 4	Domestic Science.....8	Manual Training.....8
Drawing.....2	Drawing.....2	Applied Art.....2	Drawing (Mech.).....2

Second Year			
GENERAL	CLASSICAL	DOMESTIC SCIENCE	MANUAL TRAINING
English.....4	English Composition.....1	English.....4	English.....4
Geometry.....5	Geometry.....5	Geometry.....4	Geometry.....4
Latin or German (Adv.) or German (Beg.) } 5	Latin.....5	Latin or German (Adv.) or German (Beg.) } 5	Latin or German (Adv.) or German (Beg.) } 5
History (Ancient).....4	French.....4	Domestic Science.....8	Manual Training.....8
Drawing (Opt.).....2	Drawing (Opt.).....2	Drawing & App. Art.....2	Drawing (Mech.).....2

French, 4; English composition, 1; an option in the general course for English for those preparing for colleges requiring three years of French.

Third Year			
GENERAL	CLASSICAL	DOMESTIC SCIENCE	MANUAL TRAINING
English.....4	English.....4	English.....1	English.....4
3d Year Latin or 1st Year German or German (Adv.) or German (Beg.) } 5	Latin.....5	One from— 3d Yr. Latin or 1st Yr. German or German (Adv.) or German (Beg.) } 5	One from— 3d Yr. Latin or 1st Yr. German or German (Adv.) or German (Beg.) } 5
Two from French or Spanish, 4 Algebra, $\frac{1}{2}$ Year } 4	French.....4	French.....4	French.....4
Physics (1 double) } 5	Algebra, $\frac{1}{2}$ Year.....4	Spanish.....4	Spanish.....4
History (Mod.) } 4		History (Ancient).....4	History (Ancient).....4
Drawing (Opt.).....2	Greek.....5	Chemistry.....5	Physics (1 double).....5
		Domestic Science.....8	Manual Training.....8
		Applied Art.....2	Mechanical Drawing.....2

Elocution, music and gymnastics optional first half year.

Fourth Year			
GENERAL	CLASSICAL	DOMESTIC SCIENCE	MANUAL TRAINING
English.....4	English.....4	English.....4	English.....4
4th Year Latin or 2d Year German or German (Adv.) or German (Beg.) } 5	Latin.....5	Two from— 4th Year Latin or 2d Year German or German (Adv.) or German (Beg.) } 5	One from— 2d Year German or 4th Year Latin or German (Adv.) or German (Beg.) } 5
Two from— French or Spanish, 4 Chemistry (1 dbl.) } 5	French.....4	Spanish.....4	Spanish.....4
Adv. Math. $\frac{1}{2}$ Year } 5		Physics (Double).....4	Chemistry (1 dbl.).....5
Astron. $\frac{1}{2}$ Year } 5		History (Am.) } 5	Sci. Geom. $\frac{1}{2}$ Year } 5
Geology, $\frac{1}{2}$ Year } 5	History (Ancient).....4	Civics.....5	Adv. Math. $\frac{1}{2}$ Year } 5
History (Am.) } 5	Greek.....5	Domestic Science.....8	History (Am.) } 5
Civics.....5		Physic. & Hygiene.....4	Civics.....5
Drawing (Opt.).....2			Manual Training.....8
			Mechanical Drawing.....2

One year of science required in third or fourth years in general course.  
One year of history required in domestic science course.

## TECHNICAL COURSES

## First Year

COMMERCIAL	BOYS' INDUSTRIAL	GIRLS' ART	GIRLS' INDUSTRIAL
English.....5	English.....4	English.....4	English.....5
Arithmetic and Geometry.....5	Arithmetic and Algebra.....4	Algebra.....4	Arithmetic and Algebra.....5
German or Spanish.....5	Industrial Geog- raphy.....4	Botany or Zoology.....5	Applied Art.....5
Commercial Geog- raphy.....4	Drawing.....4	Art.....10	Cooking.....4
Penmanship and Ap- plied Art.....5	Turnings, Patterns and Cabinet Making.....16	Physical Training.....2	Sewing.....8
Physical Training.....2	Phys. Train g (Opt.).....2	Music.....1	Physical Training.....2
Music.....1		Elocution.....1	Music.....1

## Second Year

COMMERCIAL	BOYS' INDUSTRIAL	GIRLS' ART	GIRLS' INDUSTRIAL
English.....4	English.....4	English.....4	English.....4
Arithmetic and Geometry.....4	App. Mathematics.....4	Geometry.....5	Arithmetic.....4
German or Spanish.....4	Physics.....4	French.....4	Chemistry.....5
History.....4	Drawing.....4	Art.....10	Applied Art.....2
Typewriting.....10	Foundry, Forge and Machine.....16	History (Ancient).....4	Cooking and House- hold Arts.....6
History (Mod.).....4	Phys. Train g (Opt.).....2	Physical Training.....2	Millinery and Dress- making.....8
Drawing (Opt.).....2		Music.....1	Physical Training.....2
Physical Training.....2		Elocution.....1	Music.....1
Music.....1			

## Third Year

COMMERCIAL	BOYS' INDUSTRIAL	GIRLS' ART	GIRLS' INDUSTRIAL
English.....4	Chemistry.....10	English.....4	English.....4
German or Spanish.....4	English.....12	French.....4	Physiology.....4
Correspondence.....4	Drawing.....10	French.....4	Artistic Art.....5
Or Physics.....6	App. Mathematics.....10	History (Mod. and Mod.).....4	Elect. Specialty.....20
History (Anc.).....4	Shop Problems and Practice.....10	History of Art.....2	Millinery, etc., Dress- making, Tailoring and App. Needlework.....2
Typewriting.....10	Cooperative plan; alternate weeks in shop and school.....10	Physical Training.....2	Home Economics; Office Training; Sales- manship.....2
History (Mod.).....4		Music.....1	
Drawing (Opt.).....2		Elocution.....1	
Physical Training.....2			
Music.....1			

## Fourth Year

COMMERCIAL	BOYS' INDUSTRIAL	GIRLS' ART	GIRLS' INDUSTRIAL
English.....4	History (Industrial of U.S.) and Civics.....5	English.....4	American History and Civics.....5
German or Spanish.....4	Shop Science and Shop Practice.....10	French.....4	English.....4
Correspondence.....4	Drawing.....10	Art.....10	Applied Art.....5
Or Chemistry.....5	App. Mathematics and Shop Prob- lems.....10	History of Art and Physiol. & Hygiene.....4	Elect. Specialty.....20
Commercial Law and Economics.....4	Cooperative plan; alternate weeks in shop and school.....10		
Civics.....3			
Bookkeeping and Ac- counting.....10			
Typewriting and Stenography.....10			
Drawing (Opt.).....3			
Physical Training.....2			
Music.....1			

Such a program as this is clear proof that our high schools have expanded their curriculums in recent years to take in all the important academic studies and also a good typical representation of the technical and industrial arts. The high schools have shared fully in that expansion of studies which has marked the recent development of all schools from the primary to the university.

**The Course of Study** in secondary schools has been extensively discussed in recent years by leading educators. Important and far-reaching changes have been made. Instead of one course we have many.

We desire to know the value of different studies and courses for culture, for discipline and for the uses of life. First of all is the great series of humanistic studies, including ancient and modern languages, grammar and rhetoric, literature and history. This group of studies has furnished the main constituent for secondary courses for the last four centuries. It deals primarily with human life as expressed in language and literature.

**Language** has long been regarded as the most fundamental of studies because it is the medium of thought in all education and because in it are preserved the past experiences of the race. Man distin-

guishes himself from animals by his powers of speech. Language involves the logic of clear thinking. It has long been supposed to bring a very superior kind of mental discipline.

**The Ancient Languages**, in particular the Latin and Greek, because of their complete inflections and conjugations, and the fine shades of meaning they can accurately express, were held far superior to modern tongues. The classic literary style of the ancients, as exhibited in the masterpieces of Greek and Latin literature, has been esteemed by scholars much superior to the style of the moderns. From the aesthetic or artistic point of view, therefore, the ancients have long held the moderns in bondage. Great poets and orators in modern times have been confessed imitators of the ancients.

At the time of the revival of learning in Europe, nearly all the books and libraries in common use were printed in Latin, and all scholars spoke and wrote Latin. As a consequence, for three hundred years Latin held the supreme position among school studies. But with the rise of modern languages and literatures, with the appearance of such modern masters as Milton and Shakespeare, Schiller and Goethe, Racine and Molière, the ancient

tongues began to lose their supreme place. It was not, however, till the latter part of the nineteenth century that modern studies, such as the natural sciences, history, modern languages and mathematics, began to assume an equal place with Latin and Greek in secondary courses of study. This great change has been working itself out in European countries as well as in America, although more slowly and more conservatively.

The great masterpieces of Latin and Greek literature have all been translated into superior English by some of our best writers and poets. It is now claimed that a student can get a better understanding of the content and spirit of Latin and Greek masters during the school period by reading these translations than by the laborious study of the originals. The average student has not time to master the Latin language so as to read Latin authors in the original, much less the Greek. In consequence Greek has almost disappeared from our high-school courses during the last thirty years. The old notion of discipline through the drill in Latin and Greek has lost much of its force in recent years, because it is held that modern studies which are of greater practical service are equally valuable as discipline.

On the other hand Latin is likely to retain its present place and importance in secondary education, because it is a sort of mother tongue to all the western European languages, and serves as a linguistic basis for all study of English, French, German, etc. All of our modern languages are full of Latin. Our literature is permeated with Latin words, thought and spirit.

**Latin.**—The high-school course of study in Latin usually includes some of the chief writings of Caesar, Cicero and Vergil. The first year is chiefly preparatory to the study of Latin authors. A series of exercises is provided in the inflections and conjugations of Latin words, with the memorizing of Latin vocabularies and the composing of Latin sentences.

The first book of Caesar's *Commentaries on the Gallic Wars* is sometimes read during the first year. Three or four books of Caesar are translated into English, with a constant drill upon the rules of Latin construction.

The third year is usually given to the study and translation of Cicero's *Orations*, especially the four against Catiline, and three or four others. These are the greatest orations in the Latin language, and have been the models for the great orators of modern times.

The fourth year is usually devoted to the study of Vergil's *Aeneid*, the great epic poem of the Latin tongue. From three to six books are read. Other Latin authors are sometimes substituted for the above mentioned, as Eutropius, Sallust, and Livy.

Parallel with the study of Latin writers it is customary to give a course in the history of Rome, to present a fuller biography of the great authors, and to bring out the historical background of their writings.

The Latin course is continued for two or more years in college, for those who wish to specialize in Latin studies. Other great Latin masterpieces are read, as Cicero's essays on friendship and old age (*De Amicitia* and *De Senectute*), the historical works of Livy and Tacitus, the

comic plays of Terence and Plautus, the poems and odes of Horace, and the works of Seneca, Juvenal and Quintilian. This series of great Latin masters is not very long, but it is upon them chiefly that the fame of the Latin tongue rests.

One of the chief difficulties in the learning of Latin is that there is no easy introductory Latin author suitable for boys and girls. Caesar's *Gallic Wars* are usually read first, but this is a difficult book for beginners. Various attempts have been made to overcome this difficulty, e. g., by using Æsop's *Fables* in Latin. Other stories have also been written in Latin for the benefit of children. The fact is that none of the great Latin writers ever thought of writing stories for children. They are all for adults.

Excellent translations of all the great Latin writers are now easily obtainable in our libraries, so that English students not versed in Latin may easily make the acquaintance of their works.

**Greek.**—The study of Greek embraces a similar course in the masterpieces of Greek literature. The high-school course in Greek, formerly required for admission to college, but now pursued by only a few students, consisted of preparatory studies in inflections and grammar, and about two years' work in translating the first books of Xenophon's *Anabasis* (the march of the ten thousand Greeks into Asia), and Homer's *Iliad* (the first four or six books or the *Odyssey*).

This high-school course was followed up in college by the reading of Demosthenes and Lycurgus' orations, the histories of Herodotus and Thucydides, the dramatic works of Æschylus, Sophocles and Euripides and the philosophical writings of Plato and Aristotle.

The literature of the Greeks, as revealed in these works, is generally regarded as superior in quality and artistic form to that of the Romans.

**The Modern Languages**, especially German and French, have become established in our high schools as standard linguistic studies on a par with Latin. The colleges also accept them as full equivalent for admission. The question may be fairly entertained whether it would not be better to begin foreign languages with German in the grammar school and follow later with Latin.

The reason for this rapidly growing prominence of the modern languages is not difficult to explain. They are, first of all, great literatures, enriched with the masterpieces of preeminent philosophers, poets and artists. In richness and variety of content these modern languages far surpass the classical tongues of antiquity. In fiction or novel writing and scientific treatises we have extensive fields of literature for which the ancients have no equivalent. Another advantage of the modern tongues is that they are much more easily and quickly mastered than Latin or Greek. After a year's study of German the student may enter completely into the spirit and meaning of the great German masters, while it requires several years of laborious study to reach the same result in Latin. This is no small advantage, considering the wide range of studies involved in a modern liberal education.

German is also an inflected language and brings to the English student a grammatical training similar to that of the Latin.

The severe mental discipline attributed

to Latin may be counterbalanced by the increased interest and literary enjoyment derived from the study of German masterpieces. The higher cultural value of the modern tongues is far more accessible to the student than the old culture.

On the other hand the practical value of German or French for purposes of conversation, for travel, for business, and for immediate use in literary and scientific studies is great. This readily available utility of modern languages gives motive and impetus to study. The scholar in almost any field of research, the diplomatist, the merchant, and the teacher find ready use for German. We meet the German everywhere, in business, in science, in education. He, with his language, is one of the drive wheels of modern civilization.

French, formerly studied more than German, has been somewhat superseded by German in America. Yet the French language, like the German, is of next kin to English, and has the same advantages for us as German, a great modern literature, easily accessible, and wonderfully rich in cultural value.

The broadening effect of a modern tongue, the enlargement of the field of vision, and the wider sympathies for a different race are some of the chief advantages in modern language study.

**English.**—The study of English has risen into great importance for high schools in the last twenty years. As our respect for ancient literature has dwindled, our appreciation for our mother tongue has increased. Vigorous and continuous efforts have been made of late years in high schools and colleges to put the instruction in English upon a stronger basis. There is a good reason for making the study of English more important and thorough than perhaps anything else. First of all, good choice English is necessary in all studies and throughout life. It is the most practical of all studies both for the ends of good scholarship and for strong citizenship and business success.

**English Literature**, in the richness and variety of its culture materials, is the first of all great studies with which to expand and fortify the mind. The average student, too, has a chance to get at the master minds of English thought directly, without laborious years of study as in Latin. Scott, Byron, Carlyle, Tennyson, Webster, and Emerson may speak directly to all without tedious delay. No other thought material thus available to high-school students is so thought-provoking and so strong in its educative effects as are the great essays, orations, poems and histories. It is stimulating in a high degree, if we can only find the material suitable to each mind. Literature is also so many-sided and varied that it will adapt itself to the most diverse dispositions.

**Composition.**—The study of English from the standpoint of composition and rhetoric is more formal and perhaps more tedious, but of great importance as a training in thought organization, in simplicity, force and accuracy of expression. Each person must learn to use English in his own way, and to develop some originality and individual force. But the imitation of good models, criticism of faulty style, drill in outlining, paragraphing and correcting grammatical form are indispensable. Even spelling and punctuation, correct forms in letter writing and composition, are not useless but of direct practical value. In recent years we have had many

excellent teachers of English composition in high schools.

**Rhetoric** is a discussion and study of the essentials of style as it appears in good authors. It brings out and illustrates the various forms of discourse and the peculiarities of each, the figures of speech and their force, the value as seen in the best writers. The working out and discussion of themes, short stories, and plans of organization are treated. The student of English will find in Benjamin Franklin's *Autobiography* an interesting account of how he trained and exercised himself with his companions of the Junta in acquiring an acceptable style in writing and speaking English.

The practical value of these various branches of English study is so universally recognized that they have come to be required from all students in the various high-school courses. In scientific and business courses, no less than in the old classical and language courses, a complete training in good English is now laid down as one of the few fundamental demands made of all students alike. Its utility in the daily affairs of life is not less significant than its cultural value in broadening and elevating the mind to the level of great thoughts.

English as scheduled in high-school courses is probably the most important study of all. The Committee of Ten allowed this study five hours a week for four years, more time than is granted any other study. High-school catalogues show that this advice has been followed in many schools.

The English course as outlined in one of our average high schools is as follows: The work in English is designed to give the ability to use good English and the power to appreciate good literature, and covers the following points: Drill on the technique, spelling, punctuation, grammar, etc.; practice in the speaking and writing of simple, accurate English, with some training in declamation and debate; the study and discussion of some masterpieces of English literature, with the aim of creating a taste for such reading. The books chosen provide for the study of a masterpiece in each of the forms of literary expression—the novel, the epic, the drama, the essay, etc. An outline of the work is given herewith.

English is given in the first, second, third, and fourth years. In the first and third years, two-fifths of the time is given to composition. There is also outside reading and word study in declamation. In the third year a grammar review is given, using Scott & Buck's *Grammar* as a text. In the fourth year the history of English literature is studied, besides a number of classics, while one recitation a week is given to composition. In the second year there is a drill course in business English. This course is given five times a week for one semester and is an elective course. The work covers letter and theme writing, grammar, punctuation, and the reading of some classics. In each year except the second, six classics are studied thoroughly. In the first and third years eight books from a supplementary reading list are read at home and reported on. In the senior year there is a large amount of library reference work based on any good work on English literature. Also one long essay, over 1,800 words in length, upon an approved subject, is required of all senior students.

**History** as a study has been developing into a greater importance as a high-school branch. It includes American history, European and ancient history. History as now taught and studied is far more valuable than formerly. As a mere enumeration of facts and dates, of court intrigues and wars, history was unprofitable. History is now an effort to grasp great race movements, the development of important institutions, the life history and purposes of influential characters, and the customs, character, and industries of the people as distinguished by princes, rulers, etc. History thus becomes far more interesting and illuminating. We sympathize with the hardships and struggles of past ages and understand at that cost our present comforts and protection are secured. On the one side history has become more biographical, dealing with great representative leaders more fully and dramatically. On the other side it is becoming more social, more democratic, devoted to the interests and welfare of the common people. We may all learn the greatest lessons from history.

By reason of the improvement in methods of teaching, history has become a very interesting and profitable study. Biography lends its charm by detailing the lives of remarkable men and women. In the high schools, as well as in the elementary schools, great biographies are the life of instruction. They are concrete and stimulating to youth. The lives of William Penn, Winthrop, Raleigh, Columbus, Samuel Adams, Paul Jones, Hamilton, Jefferson, Whitney, Morse, Horace Greeley, and others bring the student into the real life and conflict of past periods of history. In Europe, Chatham, Burke, Pitt, Peel, Silvert, Richelieu, Luther, Cromwell, Frederick the Great, Gustavus Adolphus, Bismarck, and Gladstone suggest stirring scenes and great epochs of national life.

A proper treatment of history also reveals the beginnings and progressive development of state and church, of self-governing democracy, of westward expansion over states and territories, of the growth of cities, etc. Important ideas develop through long periods of history. The wonderful scientific inventions of recent years have changed the whole face of society and have caused a vast accumulation of wealth and comfort. At the same time social evils have been multiplied. History has become a broad social study. Public sentiment as developed by the press and educational agencies has become a powerful force in society, and the history of the changes by which these results have been secured is an eye-opener to the great problems of our time.

History thus is the real and effective mode of teaching civics, of training for citizenship, or intelligent cooperation in politics and social reform. The best way to get at our present problems is to trace them up in their origin and growth. Economics is not much taught in our high schools, but in connection with history the more important phases of economic development come out in concrete setting.

History is an important moral force. It teaches by example. It shows good and bad characters objectively in the panorama of national life. We always judge men and women in history from the viewpoint of high standards. Personalities impress us as benefactors of the race or as evil-doers, tyrants and enemies of social good. History well studied

gives a peculiarly valuable discipline in the power to judge and weigh social and economic problems. It requires a balanced capacity for mental deliberation, for weighing probabilities, for a fair-minded and unprejudiced estimation of forces. It is a very different kind of reasoning from that of mathematics, and is far more practical for the ordinary uses of life, of politics, etc. Our textbooks in history, because of their condensed character and epitomizing tendency, are not so lively and interesting as the larger, fuller histories. The student is often to fully enjoy and appreciate history should read at his leisure such books as John Fiske's *Critical Period of American History* and his other volumes of American history, Parkman's *Old Regime in North America*, D'Aubigne's *History of the Reformation*, Motley's *Dutch Republic*, and Carlyle's *French Revolution*. Such books throw a brilliant light upon important epochs in the life of nations.

Upon high-school students more than upon any other class of people rest later the responsibilities for leadership in political and social reforms, that is, for solving the large problems of democratic society. Historical and literary studies expand and liberalize the mind in such social studies.

**Science.**—The second important group of secondary studies is that of the sciences. Such are botany, zoology, physics, chemistry, physiology, geology, and astronomy. They have grown into large importance in recent years. We have now courses in the high school which are predominantly scientific, and some phase of natural science is required in nearly all curriculums. Fifty years ago the natural sciences had an insignificant place in secondary education. To-day they share the field of education with other great studies on equal terms.

Modern science has revolutionized life outside of the school, and it has gone a long way toward revolutionizing courses of study and methods of teaching in the schools. The first question that naturally arises is, What is the cultural and disciplinary value of the sciences? and second, What is their bearing on the utilities of practical life? We may touch on the answers to these questions as we deal with the separate sciences.

**Biological Sciences** as taught in high schools includes botany, zoology, and physiology. Botany deals with the structure, life development, and classification of plants. It comprises the vast variety and profusion of vegetable growths which cover the surface of the earth in all zones and climates. Zoology performs a like service for the countless forms of animals on land and sea, in the air and soil.

It has been a favorite idea of nature-study enthusiasts that the study of plants and animals sharpens the observing powers, trains the senses to acute perception, and provides the natural and fundamental inductive thought movement. Comparison of specimens, classification, and the discovery of natural laws follow the strictly inductive plan. Certain it is that great scientists have found the freest development of their thinking powers in pursuing these lines of investigation. Darwin and his associates, working upon this plan, developed the doctrine of evolution, which in the last sixty years has wrought a marked change in all branches of study. The doctrine of evolution, developed in purely biological studies, has been applied to human life and history, to sociology,

to politics and religion. After such great achievements the biological sciences have gained recognition as liberalizing studies on a par with history and literature.

Zoology is studied in high schools, sometimes a half year, sometimes a full year, five hours a week. A series of laboratory studies of typical animals is worked out with dissections and use of the microscope. Sufficient comparisons are made with other species to work out important classes. The following series illustrates the plan:

The common locust.  
Butterflies and moths. Other insects.  
Spiders and their allies.  
The crayfish. The clam.  
The earthworm. Vermes.  
The fresh-water sponge.  
The amoeba. Protozoa.  
The yellow perch. Other fishes.  
The common frog. Amphibia. Reptiles.  
The pigeon. Other birds.  
The squirrel. Mammals.

Each animal is studied in its native environment, in its adjustment to life conditions, and in its structure. The evolution of animal life in successive forms is traced out, and the laws of development unfolded.

Biology has also been making contributions to the useful arts and to human needs in many ways. In agriculture and gardening, in fruit growing, in the domestication of fruits and animals, in forestry, in bacteriology with relation to disease, in medicine as related to physiology and hygiene, in the great transforming industries of food production, and even in the physiological basis of psychology, biology has made the greatest contributions. Without a knowledge of biological laws as developed in recent years one cannot appreciate discussion about pure foods, about conservation of resources, about tuberculosis and other diseases, about health and dieting, about sanitation at Panama, and about the most important present-day topics in politics, education, and social progress.

**Physiology** in high schools usually requires a half year. It includes the general structure and relation of bodily organs; the vital organs and their processes and mutual relations; topics in applied physiology, such as health and sanitation; use of narcotics and alcohol; food and dietetics, first cause in accidents.

**Physical Sciences** (physics, chemistry, geology, and astronomy) constitutes the second great field of science which is studied in high schools. It deals with physical force as manifested in gravitation, in light, heat and electricity, and in chemical affinities. Physics and chemistry have become the important physical sciences for high schools and colleges. Geology and astronomy are usually reserved for colleges.

**Physics** is usually studied a full year in the third or fourth year of the high school.

There is a tendency to begin with machines and processes in the industries, rather than with purely theoretical work. Physical laws are illustrated by such machines and practical applications. Some of the leading topics are as follows: The conservation of energy; the indestructibility of matter; heat, light, and electricity and their laws; sound and mechanics; the steam engine; the microscope; wireless telegraphy; the dynamo; the electric light; the telephone; the gas engine. Careful notebooks of laboratory work are usually kept.

In the report of the Committee of Ten is offered a series of fifty experiments in laboratory physics.

**Chemistry** also requires usually a full year's study. Sometimes the chemistry precedes physics. Some of the important topics are as follows: The atomic theory; the important elements, as oxygen, nitrogen, hydrogen, carbon, sulphur, etc., and their reactions; the metals, and their preparation; organic chemistry; the application of chemistry to the industries is made prominent.

The report of the Committee of Ten furnishes a series of 100 experiments in chemistry for secondary schools.

Many of the strongest scientific minds of the last four centuries have devoted themselves to the investigation of physical and chemical problems. Galileo, Newton, Laplace, Franklin, Tyndall, Faraday, Lord Kelvin, and Helmholtz are examples. The body of scientific knowledge that has accumulated is of vast importance to the world, both as a basis for the liberal interpretation of nature and for its utilities to man. The physical sciences illustrate at their best the modern scientific method of investigation, of laboratory experiment, of reasoning by hypothesis and verification. The mental discipline gained by the study of physical science is one of the strong elements of liberal culture.

From the practical, utilitarian point of view, the increase of man's power over nature through the study of physics and chemistry opens one of the important chapters in human history. The microscope and the telescope have disclosed new worlds. Steam and electricity have produced such profound changes in human life that they are almost beyond our capacity to estimate. Commerce, manufactures, and mining are developed and controlled largely by physicists and chemists.

Schools of technology at the universities and elsewhere cultivate especially the physical sciences. The departments of engineering are equipping experts for all the important technical processes in the industries, as in railroading, in smelting and reducing ores, in ship construction and architecture, in navigation, in photography, in electrical machinery, in printing and dyeing, in steel production, in sugar refining, in electroplating, etc. The important inventions and machines of our age are applications of physical principles, as the power loom, the turbine wheel, the linotype, the stereoscope, the electric motor. These important applications of physical science have become so universal that every person of general intelligence needs to have an acquaintance with them.

**Mathematics**, especially geometry and algebra, stand in very close relation to the physical sciences. These branches of mathematics have been recognized as a very important part of the high-school course, both for their general disciplinary value and because of their fundamental relation to physics, astronomy, and scientific knowledge generally. Geometry in dealing with special dimensions works out a series of closely dependent propositions in strict logical sequence. It demands close logical thinking and demonstration. Algebra develops a more abstract kind of thinking. Many of the more difficult problems of arithmetic can be solved easily by algebraic formulas, and should be postponed to later study in the high school. Algebra and geometry pave the way for physics and chemistry, and for nearly all the technical engineering studies.

In modern times the higher studies in mathematics have acquired an almost supreme importance in the large affairs of the world; e. g., in financial budgets of nations and cities, in the mortuary tables used by insurance companies, in large engineering schemes for canal and railroad building and for irrigation, in banking and the financing of industrial and commercial enterprises, in the statistical tables of the census reports, etc.

**Economics.**—A group of economic studies has been coming into importance in high schools, such as commercial geography, the history and present status of commerce and the industries, economics and the elements of finance. The latter is usually relegated to college work. These studies are of great importance in explaining present-day conditions in society. They are of much interest to students of the secondary school, who are easily awakened to the current social problems. We are beginning to believe, also, that these studies are of importance for purposes of general culture and intelligence, and that it is the business of high schools to equip students for practical life in society as it is.

**Vocational Studies.**—Another group of studies of a still more directly practical value now constitutes an important part of high-school courses. These are business arithmetic, bookkeeping, penmanship, typewriting and shorthand. These have for their direct purpose the preparation of young people for business life. In cities and towns such studies are very popular and are usually associated with other studies of a more general cultural value, such as English, history, and mathematics.

The movement toward technical and vocational studies in the shape of manual arts is assuming great importance. This phase of secondary education is treated, however, in a separate article.

**Drawing and Design**, as taught in the art department of the high school, is the chief avenue for the cultivation of the aesthetic sense as exhibited in the graphic arts. Free-hand drawing and perspective, with a study of models and standard art forms, develop the taste for form and proportion. The elements of design and of ornament are developed in connection with free-hand sketching from nature and from models. Drawing is valuable not only as an introduction to aesthetic culture of many kinds but also as a training in accurate observation and in the power to express beauty. More recently free-hand sketching has been brought into close relation to design in the manual arts. Working drawings must be based upon preliminary free-hand sketching which develops design. Drawing as a general introduction to fine art and as a guide to artistic expression in all the industrial arts is becoming more and more important as a school study.

**Music.**—A high-school course would not be complete without systematic training in music and in physical culture. Even where there is little power to sing or play, appreciation for songs and musical compositions may be developed. The social life of the school as well as of the home is best expressed by music. Religious and patriotic sentiment, together with all the best phases of emotional life, are tempered and refined by music.

**Physical Training**, as developed in the more systematic exercises of the gymnasium and by the free athletic open-air sports, has become an essential element in the full growth of young people. It is especially

the case in cities, where a positive deficiency of physical training is apt to prevail. Strong, vigorous, athletic discipline, which produces a hardening and toughening of physical fiber on the playground and in the gymnasium, is universally needed. Only, this kind of discipline should be made a common opportunity for the great majority of boys and girls rather than for a small, overtrained minority. Young people of the high-school age should develop a sound, vigorous and healthy physical strength, which, well preserved, will stand them in good stead through fifty or sixty years of stress and strain in the regular exacting activities of mature life.

**The Small High School.**—There have been springing up in many states of the union a great number of small high schools with but two or three teachers. So great indeed is the number of these schools that more than one-third of the students in all our high schools are found in schools of not more than two teachers. In schools with six teachers or less 53 per cent of all high-school students are found.

These small schools, many of them in small villages and in consolidated rural districts, occupy a most important place in our school system. It is difficult for them to maintain a good high-school course. First, they are not able financially to employ very strong and experienced teachers. Secondly, they are tempted to lay out an elaborate four-year course suitable for larger schools.

Many village communities have been willing to tax themselves heavily for the purpose of supplying good teachers and equipment. In several states, as Wisconsin, Minnesota and Florida, the state has supplied a considerable aid in the founding and support of small high schools. For these small schools two important recommendations have been urged. First, that they furnish a good two-year course rather than a poor four-year course. After completing a good two-year course students may be sent to larger nearby schools to complete their high-school studies. Secondly, a very simple course, with as few studies as possible, is recommended, rather than a variety for election. In some cases, to give greater simplicity and fewer studies at a time, the work of two years is alternated.

The consolidation of rural districts, which has been going on in many states, has made it possible to have good high schools within reach of the great body of farm boys and girls. This is a very important movement for the improvement of country life. When this plan is well worked out it will bring to every boy and girl of our country districts the opportunity for a high-school training, and thereby the door is thrown open to the higher schools and opportunities of life. Consolidated rural schools become also important social centers in a still broader sense. Concerts, lectures, and reading rooms, made accessible by good roads, will do much to make such combined schools great factors in rural life.

The ideal set up for our school system as a whole is to furnish every boy or girl, whether in the country or city, an opportunity to secure a complete education, and to bring this opportunity directly to the home door of every child.

**Teachers in Secondary Schools.**—The efficiency of the secondary schools depends upon the character and qualifications of the teachers.

The greatest question of all is how to secure efficient, broad-minded teachers. The social position and recognition of teachers in the community have much to do with this effort to secure a strong teaching force. High-school teachers, by their character and attainments, should command general respect in the community. It is of great importance that the communities should hold teachers in high esteem for their professional, personal, and superior social qualities. Otherwise the higher standards of culture and discipline such as must prevail in first-class high schools cannot be maintained.

The greatest of all difficulties that our high schools have to deal with is the prevailing low standard of scholarship and of social life.

**New Community Ideals Needed.**—Our American communities are not yet strong and virile in their educational and social standards. There is a sort of universal decadence and looseness, a lack of tenacity in maintaining and pursuing strong ideals. The average family is indifferent to those higher aims. This makes it very difficult in our average community to maintain an energetic scholarly high-school spirit. The positive superiority of the teaching force and the unequalled recognition by the community of their authority and leadership in matters of education are primarily necessary. In Germany this strong spirit prevails very largely. The teachers in the *gymnasiums*, or secondary schools, are marked characters, commanding a positive respect in the community. The American people are willing to pay taxes and to support first-class schools, furnishing equal opportunity to all for higher education, but they have not yet learned to back up the teachers and the standards of the school by the firm support of the home and of a strong community spirit.

Strong, well-paid teachers, permanent in their positions and commanding respect for their successful experience and professional attainments, are absolutely necessary to the maintenance of first-class high schools. There is a steady movement toward improvement in these respects. These schools are still new and in the making, but there is good prospect that we shall yet work out the best system of public secondary schools that the world has yet seen. The teachers themselves by setting up good standards, and by progressive efficiency in their work, can do much to improve the character of the schools, but the people themselves in our local communities are the ultimate source of power and influence, and in our democratic institutions progress cannot greatly outstrip the prevailing standards among the people.

For this reason our school system has developed more slowly than secondary schools in France and Germany. The authority of the state, in those countries, has set the standard, and has imposed the conditions of higher education. Educational experts of the best ability have been employed by the state to work out courses of study and to administer the system. In this country, on the contrary, the people in each community, by their own free choice, have established, organized and supported such schools. Our school system is, therefore, a direct expression of the desires and standards of the people, and is broadly founded in popular consent.

**Social Life** in the high schools has developed in recent years some peculiar difficulties, and, in general, while this social spirit

and its forms of manifestation are of the utmost importance, it is as yet difficult to lay down rules for regulating it. There are two important facts peculiar to American high schools. First, they are mainly coeducational; second, they are purely democratic. The social life, therefore, whatever it is, must be laid out on a broad liberal foundation.

The scientific study of adolescence in late years has brought out more clearly the social characteristics of young people at this period of life. The social impulse at this age is strong, spasmodic, tumultuous, freakish, and is especially unstable and unpredictable. Excessive reserve and diffidence under some circumstances are balanced by boisterousness and recklessness in other cases. While they are frank and confidential with one another, they are often reticent and unapproachable toward their elders. But the instinct for personal friendship and social grouping is very strong. They respect able leadership among themselves or in their instructors. At no time in their lives do they more need sympathetic but firm control. The presence of boys and girls together in all the classes and social events of the school has both advantage and disadvantage, but so long as this condition must be met it calls for the best skill and wisdom of teachers to create a wholesome and respectful relation between them.

**Student Organizations.**—The high-school students have combined into a variety of social organizations, some of which, like the debating and literary societies, musical groups and orchestras, art clubs, and athletic teams, are on the whole natural and appropriate expressions of the natural instinct. Others, such as the secret fraternities and sororities, and such exclusive groups, that meet secretly in their own clubrooms in the towns, have caused serious evils which have menaced the school.

A committee of the secondary school department of the National Educational Association reported on the subject of high-school fraternities in 1905 as follows:

*Resolved, that we condemn those secret organizations, because they are subversive of the principles of democracy which should prevail in the public schools; because they are selfish, and tend to narrow the minds and sympathies of the pupils; because they stir strife and contention; because they are snobbish; because they dissipate energy and proper ambition; because they set wrong standards; because rewards are not based on merit, but on fraternity vows; because they incite a feeling of self-sufficiency among the members; because they are expensive and foster habits of extravagance; because they bring politics into the schools; because these societies exist to such an extent that they distract interest from study; and because all legitimate elements for good—moral, social, and intellectual—are better supplied to the pupils through the school at large in the form of literary societies and clubs under the sanction and supervision of the faculties of the schools.*

While the Greek letter fraternities have proved unsatisfactory as a solution of the social problem in high schools, serious efforts are in progress to meet the legitimate demands of social life in other ways.

**Legitimate Recreation.**—In addition to the literary and debating societies, the athletic and gymnastic events, the groups organized for voluntary readings in literature, science and art, the bands and choral societies, efforts have been made to provide receptions, class parties, excursions, dramatic entertainments, and suitable dancing for high-school students.

The high school itself has been developing into a social center where social functions are frequent, where lectures and concerts are provided, where the parents are

invited on special occasions to inspect the products of the school in manual arts, in cookery and dressmaking, in drawing and music. Class plays and dramatic entertainments are not infrequent, especially in commencement week. In communities where the people and the teachers have learned how to make the best use of the school plant, the high school becomes not only the place for the formal education of the boys and girls but also the intellectual and social center of the community. There seems to be no good reason why the use of the school building should be limited to eight hours a day, five days in the week, nine months in the year. On the other hand it may with great profit be used at any time for the social and intellectual improvement of the entire community. Lectures, entertainments, and social gatherings for all, may well be given in the high-school building under the cooperative leadership of teachers and citizens, thereby extending very materially the intellectual, social, and moral influence of the school. The people of communities in which this policy has been tested are very appreciative of the results. (See *The American High School*, Brown.)

In all these social diversions the quiet cooperation and control of various members of the faculty are presupposed. High-school pupils have not yet reached the stage of development where they can be turned over to their own volition in social matters. The natural tendency of our American life may have been to throw young people in the adolescent period prematurely upon their own resources. There has been too much of freedom and indulgence. There is necessity in the home and in the school for a quiet but firm control, and for a wise interference on the part of children and of wisely exercised authority on the part of parents and teachers. The fate that has overtaken the high-school fraternities and exclusive clubs is a definite proof and warning that children of high-school age have not yet attained to proper judgment and self-control for independence. They are still under the somewhat autocratic authority of the school and the home, and this authority should be definitely and intelligently exercised.

**The High School as a Social Center** is a favorable place where parents' meetings are held for the discussion of these social and school problems, and where plans can be worked out for a more intelligent cooperation of parents and teachers. One of the serious difficulties for most high schools is the strong tendency toward social dissipation which interferes with the school studies and exhausts the physical energy of young people by late hours and social excitement. Parents are often foolish in permitting this mental and physical waste. The high school greatly needs the support of intelligent homes in maintaining the high standards of the school and in discouraging social frivolity. The high school as a social center is a meeting ground where parents and teachers can come to an understanding on these important matters.

We may observe also that the high school is the only institution in most of our communities that has real power to set up and enforce for adolescents high standards of scholarship, vigorous mental discipline, and that steady continuity of effort which achieves important results. The family and the church are not equal to such tasks. The standard which pervades the intellectual and social life of any



community is on a distinctly lower plane. It is the special and almost exclusive function of the high school to tone up and strengthen the intellectual life, also to set up standards and ideals which will appeal to the enthusiasm of youth, and finally to teach youth to undergo the steady, persistent labor which changes these ideals into realities. Looked at from this point of view we can hardly overestimate the importance of a good system of high schools to the nation.

**Methods of Instruction.** It has been assumed by most thinkers that the general method of instruction in secondary education is quite essentially different from that of elementary education. The report of the Committee of Fifteen, for which Dr. William T. Harris was chiefly responsible, attempted to explain and demonstrate this difference. According to this view, elementary studies deal with the immediate aspects of the world, with what may be called facts and data. The secondary course deals with the separate, formal and dynamic aspects that lie next in order behind the facts of observation. That is, secondary education is chiefly employed in classifying and isolating knowledge into separate sciences. This principle, properly understood, may show us where to begin the secondary course of study, whether at twelve or fourteen years of age.

The elective system of choosing studies according to the needs or preferences of individual students has been generally introduced into high schools. It began in the colleges and universities about 1878 to 1880, and has gradually spread to the secondary schools. One reason for this is the great enlargement of the general field of study in recent years; that is, the multiplication of new and modern branches, such as natural sciences, economics, history, manual arts, technical and engineering branches, etc. It is totally impossible for a student to compass all these studies, and selection is necessary.

Another reason for elective courses is a closer adjustment to the ability and needs of students. The problem of adjusting studies to individual needs is a complicated one, depending upon our estimate of the disciplinary and culture value of studies, their vocational service, and upon the proper connection and organization of the studies themselves. The old classical course was very narrow, almost purely disciplinary, and was imposed upon all alike, regardless of natural ability or preference. Some high schools have gone to the other extreme of miscellaneous and loosely constructed courses, where the student is allowed to make almost any combination of studies giving a required number of units. The experience of the last thirty years, however, has brought some definite results in the way of well-organized courses, allowing considerable freedom of choice, while securing unity and strength in educational development. First, a number of standard courses have been worked out, each of which gives a connected liberal education, including the essential elements of culture. The student may choose and follow one of these courses best suited to his needs and preferences. Second, a student, in a few high schools, is allowed to choose somewhat freely among all the studies offered but is limited to a proper sequence of studies determined by the dependence of some subjects upon others. Third, certain studies are now regarded as fundamentally important to all courses, such as English, history and

mathematics. "At present it may be said that throughout the secondary schools of the United States there are prescribed: A foreign language, algebra and geometry, English, a science, and one year of history. This makes about two thirds of the course, leaving certain possible alternations to be made according as the student aims to enter this or that college, or to go into active life."—(Dutton and Snedden.) A thorough command of spoken and written English as gained through the study of grammar, rhetoric, and composition, and English literature, is now regarded as of fundamental importance to all students, irrespective of their special purposes in life. Fourth, high-school principals and teachers are expected to consult with individual students, and, after due deliberation, advise them as to their choice of studies and of courses, taking into view their preferences, their choice of a vocation, etc.

In small high schools with but two to four teachers the course of study must necessarily be limited to a few studies, and not much choice among electives can be given. As noted earlier, these small schools include more than half of the high-school population of the country.

High schools naturally adjust themselves to the needs of their local communities. In rural consolidated schools agriculture is taught. In commercial centers business arithmetic and bookkeeping are taught. In manufacturing and mining centers studies appropriate to the needs and demands of the people are offered. Our high-school courses present, therefore, a liberal variety of studies and of plans.

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## INDUSTRIAL EDUCATION

Industrial Education, as now interpreted, embraces manual training, domestic science and household art, vocational and trade training, and high-grade technical training. It is important that the several parts of this wide range be carefully distinguished.

**The History of Manual Training for Boys.**—While many thoughtful people had deplored in the city schools the lack of a kind of education which should train boys to be both "able and willing to work"; while Carlyle had already said, that "man is a tool-using animal," and that "without tools, he is nothing; with tools, he is all"; and while experiments of vari-

ous kinds, at home and abroad, had been made in whittling schools, commercial shops, manual labor schools and in tool laboratories, as adjuncts to art schools, normal schools, and engineering schools, the first regular manual training school in which systematic tool instruction and practice was incorporated with an academic course of study of secondary grade was opened in St. Louis, Mo., in September, 1880.

The school was organized for boys of high-school age and grade as a preparatory department of the engineering school of Washington University. It was not a free school, and it has never been aided by public funds. Two or three years

later it was followed by similar schools in Chicago, Toledo, Baltimore, Philadelphia, and elsewhere in rapid succession, until manual training, closely resembling the original type, has spread over the whole world; sometimes on private foundations, but more often as an integral part of the public school system.

**Putting the Whole Boy to School.**—Manual training as originally conducted and expounded was essentially a culture study. Of course it was and is useful objectively as well as subjectively, as all sound culture is. All true culture is serviceable, and the greater the service the finer the culture; non-serviceable culture is inhuman.

What is now known the world over as a manual training school is organized:

1 To develop the whole boy by exercising every part of his brain.

2 To enable a boy to discover his unborn capacities and aptitudes.

3 To lay a broad foundation for a higher education.

4 To furnish those who look forward to industrial life an opportunity to master the knowledge of the materials, drawings and methods of construction, as well as the academic subjects usually taught in a high school.

**The Fruit.**—Manual training is no longer an experiment. The conspicuous record of thirty years' experience is that the young men thus trained have brought to the ordinary duties and responsibilities of life, intellectual and mental grasp of actual conditions which has at once gained for them a clear advantage. They have shown that some mechanical skill and a great deal of mechanical comprehension and power of mechanical analysis have been valuable assets, and not unfit accompaniments of refined tastes and good manners. The training has opened new roads to modern scholarship, and new avenues of usefulness to many a lad, and has enabled many others to choose their occupations more wisely, either in the direction of the industrial arts or in other fields.

**The Method.**—The tools studied and used are those requiring delicacy and skill, embodying wealth of thought and experience. They are studied separately, and correct usage is mastered gradually.

Particular care is taken to teach correct theory and the best usage. There is a possible elegance in handling a tool, as there is in handling the painter's brush. The untrained "wood-butcher" is obsessed by a desire for originality, and the result is a bad form which perpetually fetters him. The teacher of tool-work must teach the best, and his work, his choice of tools, and his sequence of steps must be of the highest grade. Coarse, heavy work involving nothing but brute strength and repetition is avoided. Woods and metals are the chief materials studied and wrought. The emphasis is put upon processes, upon order, and system.

**Where the Value Lies.**—The aim is intelligent mastery and the power of mechanical analysis. The value of the finished article or exercise lies not in its subsequent use but in its embodiment of ideas of fitness, economy, accuracy, grace and appropriate finish. Every detail of form is first written in the language of drawing, in the making and reading of which the student must be an expert. The materials wrought must be real and suitable. No make-believes, like wooden swords, paper bridges and unscientific designs, are tolerated.

There is no fear of a lack of interest or of failure to develop a love of service. The possessor of cultured mind and a skillful hand finds pleasure in service as naturally as a ripe peach carries pleasant flavor. Parents and casual visitors are apt to overrate the value and significance of show pieces, which invariably represent great misuse of time, loss of breadth and thoroughness, and, too often, borrowed workmanship. It is well to postpone practical jobs till vacation and the spare hours of holidays. Again and again critics who ask about marketable products are told that the only article put on the market is well-trained boys.

**Fundamental Rules.**—While the mechanic arts may be applied in a hundred different occupations, there are many typical processes which are common to all. The care and proper use of cutting edges; the analysis and command of machine tools and implements; the influence of heat upon both woods and metal; the study of form, and a recognition of the conditions of stability, strength, and stiffness, involving a cultivated sense of proportion—such things are of universal value, the well-trained boy is quick to see their application in the various occupations of modern industries.

**Not a Factory.**—A manual training school does not aim to be a factory. As soon as a boy has mastered all the elements of a complex construction, he should then aim to complete it; when he has become able to produce a satisfactory article of domestic or commercial use, he should proceed to learn something else, not stop to produce it. There is no educational fruit in doing again and again what one already knows how to do well. There may, of course, be economic fruit, and therein lurks one of the perils to which manual training is exposed; viz., the thirst and hunger for production, for "making something."

With a very little training a boy can make pieces of furniture which is creditable for a boy; but much too often the time is not well spent. Of course occasional synthetic exercises should be introduced to show the relation of parts, the necessity for precise work, and to cultivate the taste and judgment; but uneducational repetitions and premature combinations should be avoided.

**Class Instruction.**—The skillful teacher teaches the proper care of a tool, its correct usage, and a typical process, to all the members of the class at once, with great fullness of both word and deed. Exact methods are clearly shown; there is no fear of checking the growth of individuality, just as there is none in teaching Latin or orthography, arithmetic or music. Synthetic exercises, or projects, are individual, selected advisedly from local suggestions.

**Shop Equipments.**—While only the best tools should be used, no attempt should be made to rival commercial shops. Lathes, planers and drills need not be large or very expensive; no school for boys should be able to boast of doing heavy work suited to skilled mechanics; such boasting would be a discredit. All edge-tools in frequent use should be individual, and their condition, as well as the private tool-drawers of class members, should be frequently inspected. In every large shop there should be special provision for the class lecture and demonstration.

**The Materials Used.**—Woods, hard and soft, fine and coarse, easy and difficult

to split; of various colors and shades; green and seasoned; iron, cast and wrought; steel, hard and soft, brittle and malleable; brass and alloys—all are intelligently studied. Much economy is possible by causing the same piece of stock to illustrate a series of processes; for example, a short piece of a steel rod may successfully serve for an exercise in turning a plain smooth cylinder of given dimensions, next, for cutting a screw with a definite thread and pitch; next for turning a taper of given diameters and length; and so on. Just as a chemical reaction or a cooking process may generally be shown in a test tube, so important mechanical details may be illustrated with the use of a small amount of stock.

**The Schedule of Hours.**—Ten hours per week should be given to shop and drawing combined, and a single exercise should rarely exceed two school periods. When the limit of close attention and lively interest is reached, education stops. The factory boy may work all day, repeating almost automatically a few motions, but his stimulus is the money he is earning, not educational progress through mastering a new tool or process. In short, the commercial shop furnishes no guides for the manual training school. In form, in spirit, and in procedure, it is widely at variance.

**Manual Training for Girls.**—The immediate success of manual training in promoting mental clearness and practical efficiency in the case of boys, early led to the organization of corresponding courses in domestic science and house hold art for girls, and to an extension, in elementary forms, of those new features for both boys and girls, downward to more or less of the grammar grades.

In many cities, as for example in St. Louis, manual training or domestic science is required of all pupils of the seventh and eighth grades of the public schools, and both are offered free, in fully developed forms, in all the high schools.

**Needlework,** carpentry, is chiefly joinery. The carpenter learns how to connect properly and securely one piece of wood with another; so the seamstress learns how joints can be made and how one piece of goods may be fitted to another. The fundamental stitches should be learned one by one, and then comes the art of cutting to fit and cover. The making of garments should not be introduced too soon but should be constantly held in view.

**Instruction Before Construction** is as important, in needlework as in arithmetic or cabinet work. The nature and uses of different yarns and threads should be made clear, and incidentally every girl should learn how to darn and mend. Propriety and economy should be taught by precept and example. A few hand-made garments, selected for the purpose of illustrating the uses of what has already been mastered, may well crown this part of the course, but excessive repetition must always be avoided.

**Machine Work** should supplement handwork, and pupils should be made to see the strength, beauty, and economy of machine work. The sewing machine itself is a fine object for careful study. Its proper care and various functions form an excellent series of lessons, which, as a rule should be, not individual, but to all members of the class at once, as detailed for boys under "Method" in the earlier part of this article.

**Dressmaking and Millinery.**—The elements of both these branches should be covered in a general way, but the emphasis can be put where local interests can be best served. Great importance attaches in every community to a proper knowledge of the nature and uses of woven goods for garments light and heavy, napsery, hats, drapery, and carpets.

**Economy and Thrift.**—No teacher should fail to impress the necessity of economy and thrift in the making, purchase, and care of garments. Cleanliness is a cardinal virtue, but all unreasonable wear and tear in the laundry should be shunned. A few lessons on the nature and influence of soap, and the processes of washing, ironing, starching, etc., are valuable for every girl.

**Equipment for the Sewing Room.**—The sewing equipment need not be expensive. A few machines of various makes, including a "blind-stitcher" of the best design and some laundry fixtures, are all that are necessary; the main thing is a competent and well-trained teacher—but here is no exception, for such teachers are needed everywhere; all our special instruction would be wasted on ignorant and untrained teachers.

**Cooking and Household Arts.**—It is safe to introduce one's remarks on cooking with a "don't." *Don't begin with a cookbook*, which is only a collection of recipes, good, bad, and indifferent. Begin with fundamental principles, as is done in every other department of education.

A second don't may well be: "Don't take it for granted that the class must begin to cook meals at once. Teach and study processes. Take a simple article of food which requires cooking, like a potato; it may be boiled or steamed, or fried or baked; or two of these treatments may be combined to advantage. Make notes of temperature, moisture, and time. A single potato will suffice for a great deal of instruction and practice. Do not be afraid of test-tubes and Bunsen burners. When a specimen is to be tasted, pay great attention to seasoning and flavors. Good material, well cooked, is often served without seasoning or flavor, and as a consequence it is almost unpalatable. On the other hand poor material, well cooked, seasoned, and flavored, is eaten with a relish. Some chemistry will be introduced by the good teacher, but it should be carefully adapted to the age and attainments of the class. The effect of high temperatures in forming a closed covering or wrapper for meats and pastry; the release of gases whereby bread and pastry in general are rendered porous and light; the proper temperatures for cooking eggs, heating milk, baking bread, and stewing fruit—all such things should be explained, illustrated, and made reasonable. All the while teach the habit of weighing and measuring, when exact weights and measures are required. Many things must be learned by experience and observation. As the artist said, he mixed brains with his paints in order to get the right colors, so the skillful cook must put judgment into every dish.

**How Not to Do Things.**—It is often well to prove that the obvious way is the wrong way, by producing a worthless product. Bad methods of cooking are common, and hence they should be pointed out, and illustrated, so that they may be avoided. Unfortunately "Mother's way" is not always the best way, and the careful teacher should show where it goes wrong

or is lacking, and how it may be improved. It is always best to crown every point achieved by an edible dish, but do not allow unwholesome preparations to be eaten. There is no economy in eating stuff that should at once be thrown to the hogs. On the other hand there is no end of economy in keeping and skillfully serving "left-overs." Some things are better the second day, and many things are best so deftly prepared and combined that they appear to be dainty originals.

Every girl should learn how to set a table, cook and serve a meal, wash and put away the dishes, and keep a kitchen and pantry clean and in perfect order.

After plain, ordinary cooking, should come fancy preparations; food for infants and the sick, preserves, jellies, etc. In a word, the mistress of a house and home should be so trained herself as to be always able to give directions, and if need be to instruct her cook, and to take her place.

**Housekeeping.**—The above specific lessons to girls, should be supplemented by a few elementary lectures upon housekeeping, house-planning, and decoration, and upon the functions and responsibilities of motherhood.

**Culture and Use.**—Thus far the aim has been the development of the hand and the both boys and girls, with study of appliances in processes which are essentially useful, and which may later on be put to practical use. The intelligent, alert mind is held to be first in importance, but the possible practical use of the training has not been ignored. There has been no bias toward particular vocations; all doors are left open and the ambitious youth should make the most of them and impartially. Culture and usefulness should characterize the training of every one whose circumstances will admit him to such advantages.

The following paragraph is quoted from one of our most thoughtful educational writers, Mr. James P. Monroe:

"The next genuinely educational business before a community is to prepare the child for that industrial usefulness, to himself and to the community, which is fundamental to good citizenship. He is virtually but half educated so long as he has not acquired such necessary industrial qualifications as manual control and dexterity, cooperation of brain and hand, quickness of adaptation, fertility of resource, concentration, 'gumption,' and has not been given, on top of these, ample opportunity to secure the groundwork of some special trade or industry. Without such essentials he is likely to join that appalling army of 'floaters' who, without a trade or any chance of learning one, wander from one casual occupation to another, depressing wages, inducing enormous industrial waste, and swelling at last the costly ranks of vagrancy."

It is the height of folly to train either a boy or girl without some reference to future needs and responsibilities. As well teach a Choctaw the use of an Australian boomerang, or how to play on a Siamese tom-tom, as to spend his precious youth in learning the rudiments of subjects utterly remote from his life and probable duties. In America, occupations are as a rule not inherited; but circumstances in a great majority of cases plainly indicate not only what is possible but what is probable, and the wisest preparation for future success.

**Vocational Training.**—The vast majority of boys must start as manual workers, and public education should ever be shaped to meet the needs of the majority. Hence vocations should be kept in view. The resources of soil and mine; the energies of wind and stream; the wealth of inherited skill and cunning inventions; the hundreds of industrial processes in shop and field—all should be conserved and utilized. The judgment of educational leaders to-day is that we should make the courses of study offered in our schools more democratic, that they may meet the conditions of our modern commercial and industrial life.

Undoubtedly the most vital educational and social question of our time is what to do for the multitude of boys who now leave school too early. For every thousand young men who pass through certificated schools and enter colleges of letters and schools of engineering there are four or five thousand others, capable and worthy, who never stand on the threshold of a secondary school, much less knock at the door of a college.

It is an exceedingly important fact that each one of these thousands of boys who do not enter the high school and who, as a rule, go no more to any school, is entitled under the law to an education as well suited to his needs in a career as an industrial worker as is the boy who wins a certificate and who expects to go to a college or a school of engineering. Beyond question the welfare of the nation is as much dependent upon the proper training of the former as upon the proper education of the latter. The greatest burden our country is carrying to-day is the tremendous army of untrained, uneducated laborers.

To lighten this burden, and to thereby promote the public welfare, both grammar and high schools should embody industrial features in their curriculums.

**In Rural Schools.**—Where boys of from 12 to 18 years are in attendance, not only the use of hand-tools for working wood in the construction of joints, frames, and shelters, but the fundamental principles of agriculture, horticulture, the raising of stock and poultry, dairying and the culture of flowers and vegetables, should be taught. Boys from the farm should be taught the uses of farming machinery, and how to properly care for it when not in use. Tools are ruined by rust and exposure more than by proper service. It is no mean art to properly sharpen and preserve edge-tools.

**All Wood and Metal Occupations** should begin with a careful study of the theory and functions of hand and machine tools, and with systematic instruction regarding processes as outlined above. Thus the doors are opened wide to scores of useful trades where tools and processes are specialized and applied.

With all such work mechanical and free-hand drawing should be learned, so that a boy can readily read and make drawings for shop or home use. Skill in free-hand drawing based on mechanical lines is easily acquired and very useful. Isometric drawing is extremely simple, as is cabinet perspective.

Vocational training has for its chief aim a mastery of the tools, materials and processes of a particular trade or occupation, accompanied by mechanical drawing suited to the occupation; hence vocational training is much less broad, though in some directions much more intense, than

manual training. For advanced pupils it becomes trade training; for boys of from 12 to 16 years it offers a field for developing the strong points of those who are slow and inept at the ordinary book-work of the grammar schools, and who under present conditions drop behind and so drop out of the schools wholly. The aim of vocational training may be said to be to discover a boy's bent or bias, and then to develop him along that line.

#### Trade Schools and Trade Training.—

This problem has been attacked in various ways and from different sides.

The employers of skilled labor all across the land have learned that the best workmen must be taught both the theory and art of their trades. Railway companies, electric companies, metal-working establishments, and makers of goods of all kinds, train their own foremen and skilled workers in what is, in every case, a trade-school annex for a particular trade. There are hundreds of these annexes organized in a variety of ways, more or less original, with some ideas borrowed from Europe and many from each other. A characteristic of them all is the employment of teachers who are skilled workmen, and who have had sufficient experience to know what the theory of the work involves, and who are competent to teach the underlying principles fairly well. Another characteristic is that the young apprentices are paid by the hour whether they are in the school annex or in the shop.

The conditions of admission to these apprentice classes vary with the mental and physical demands of the trade or occupation. The minimum age varies from 13 to 17 or 18, and the academic standard varies from the sixth grade to a high-school diploma.

There is very much to be said in favor of this solution of our problem. Many of these schemes reach down low enough to get hold of members of the "neglected half," and to the extent of such employment they are doing great good. Moreover, the benefit to the companies and the community is great, for the result is better workmen, better work, and an undoubtedly greater interest in and loyalty to the company. The only criticism is that the training is narrow and there is in consequence a lack of versatility.

**Private Trade Schools.**—The second partial solution is that of trade schools on private foundations. Here the great difficulty has been the cost. The expense for buildings, equipment, teachers, etc., is prohibitive except in the case of a rich benefactor like Auchmuty in New York, Williamson in Philadelphia, Carnegie in Pittsburgh, Wilmerding in San Francisco, and Rankin in St. Louis. In some such schools tuition is free—in others small fees are required. In some the course of study is very short, say four months, and of course very narrow. In others it is three or four years long, combined with a full academic course, but in every one the technical range is narrow.

But all such schools, excellent as they may be, are but a drop in the bucket. It is reported that the Williamson school of trades in Philadelphia, which reaches down to the level of the class we are now interested in, cannot take in one-fifth of those who apply; and the private trade schools and the corporation-annex schools combined do not cover one-tenth of the ground. There is much left for the public schools to do.

**Public Trade Schools.**—Public trade schools supported by taxation are rare. The most conspicuous is the Technical high school of Cleveland, Ohio. This would be a regular manual-training high school were it not for the fact that, during the third and fourth years, the work in shop and class is directly aimed at four or five distinct trades, thus making it a public trade school. Incidentally, the school program embodies an innovation which is full of suggestion, viz., the school year consists of four equal terms of twelve weeks each—there being a week's vacation at the end of each term. The immediate popularity of this school should teach boards of education a useful lesson. Though built and equipped for over a thousand pupils two years ago, it is crowded and a second school of the same character is in great demand.

[It is interesting to note the effect of this extraordinary demand for industrial high schools upon the devotees of the traditional classics. The Cleveland board of education was recently petitioned to authorize the building and organization of a new high school which should be exclusively cultural, i. e., a school "in which nothing useful would be taught."]

The Portland (Ore.) school of trades, with day and evening classes, is a part of the public schools; and the evening trade-training department in the Technical high school of Springfield, Mass., is a part of the public school system. It gives promise of much more along similar lines all over the land. It should be borne in mind, however, that all evening-school training work is given to those who, for better or for worse, have already found employment.

If one were to compare the best trade schools with corporation schools he would find that the former give a broader outlook, owing to their generous academic program, and a greater range of shop processes; but the graduates of the latter excel in skill and finish of their work, and a knowledge of a particular business. This last is a matter which cannot be gained in a schoolroom; business and shop management must be learned outside of school. A few general principles may be taught and illustrated, as may banking and railroad accounting, but the organization and management of a business is largely a personal matter, and the chief clerk and the general manager have generally been trained for their work in the business itself.

**Cooperative Schools.**—A fourth partial solution of our problem is that in which manufacturing concerns join forces with boards of education for the purpose of training educated workmen who later on may become foremen, superintendents, and general managers. The manufacturers furnish shops and shop instruction; the high school furnishes teachers of drawing and academic studies. The plan may be best illustrated by an account of what has been done and is now doing in Fitchburg, Mass.

**The Fitchburg Scheme.**—Fitchburg is an active industrial city of about 30,000 people, with numerous large manufacturing establishments, so that the situation is particularly favorable for an experiment in industrial education. For some years this subject has been under discussion in social and business clubs, and a state commission appointed by the governor visited the city, and plans of an industrial school were proposed, and discussed for some time. Finally the cooperative plan was adopted and put into operation during the summer of 1908.

The plan of organization recites that an employer is bound to furnish systematic instruction in the use of specified tools and processes, such as may be agreed upon when the contract is signed. The tripartite contract, signed by pupil, parent, and manufacturer, lays down the rules and regulations governing the attendance and work of the apprentice pupil. It specifies that the school course shall cover four years, the first year being wholly in the high school; the other three years the student is in school alternate weeks, twenty each year. It specifies further that the other twenty weeks of the school year and ten of the vacation weeks are to be spent by the boy in the shop—thirty weeks of fifty-five hours each, Saturday being a half-holiday. It further specifies that during the first of the shop years the boy shall receive 10 cents per shop hour; during the second year, 11 cents per hour; and during the third year, 12½ cents. The average amount is a little over \$180 for each of the three years. It further provides that any time lost during any year is to be made up before the next year can begin, and that no diploma or certificate can be given until all lost time is made up. Finally it specifies that the apprentice boy shall carry on successfully the course of study laid down for school work, and that if any failure exists either in the boy's performances of work in school or in the shop, it will result in his being dropped out of the class; and the vacancy shall be filled, as soon as possible, by another boy.

The scheme has just recently closed its second year of shop work, there being at the present time a first-year class of twenty-one members in the high school itself; a class of twenty spending their second year in the high school and their first year in the shop; and a class of twenty-one spending their third year in the high school and their second year in the shops. Teachers, pupils, and manufacturers agree that the plan works well, and that a lively interest is sustained. There may be similar experiments elsewhere, but there is limited data concerning them.

**Advantages and Dangers.**—If this scheme stands the test of five years' trial there will be much to commend it.

In the first place, it appeals or may appeal to the neglected or dissatisfied boys who cannot or will not march to the tune of the common curriculum.

In the second place, if the cooperating employers live up to their contract, the shop work is certain to be attractive, the progress made will arouse ambition, and the correlation of mathematics, sciences, and drawing with shop work will prove to be a great stimulus to brain activity.

In the third place, this scheme of cooperation enables the public schools to help do what the schools could not superintend and foreman. He sharply questioned the boys as to their school work, and got their grades from the supervising principals. One-half of them had already dropped out of school or would have dropped out had the plan of cooperation not been offered. The boys were assigned

in pairs, and the members of each pair alternated, a week in and a week out, and it was found that partners kept closely in touch as in both shop work and school work. The resulting fellowship of interest seemed to be an admirable feature.

The attitude of the bondsmen and the parent or guardian was favorable—enthusiastically so. The shops paid the boys almost \$200 a year, which was nearly enough for food, clothing, and shelter, with a good trade in prospect and a knowledge of a good business besides.

The Fitchburg scheme reminds one of a fine definition of a good bargain—it is one in which all parties gain. The employers get what they want, a better grade of workmen, broad-minded and skillful; and the school authorities get good citizens—thrifty, intelligent men; the boys get what they want, technical skill and a chance for promotion. In short, the scheme promotes industry and the common weal.

**A Warning.**—There are, however, positive dangers to be guarded against which teachers and parents should keep well in mind. The money earned may have a corrupting influence. If it is foolishly spent, the effect is certainly bad; if it is turned in to help father or mother, and to pay for one's keep, it is fine; if it is saved for future use in college or a professional school, it is well. But in no case should the boy be induced to undervalue studies which fail to yield immediate financial returns. The price of wisdom is above rubies.

**The Most Essential Thing.**—Industrial work of all grades is too often regarded as handwork and nothing else. But handwork and nothing else has been the fate of four-fifths of the boys and girls in the past. Beyond the "three R's" the boy who felt that he must "work for a living" found little in school books and school teaching calculated to help him on the farm or in the shop. Accordingly both the boy and his parents believed that it was time for him to go to work early in life.

Hence the working man, young and old, was ignorant of the rudiments of science and polite learning, and was utterly lacking in ordinary culture. The academies and high schools were organized and maintained for college boys. They taught Latin and Greek instead of physics, chemistry, mechanic arts, and mechanical drawing.

To-day, things are changed, and the secondary schools are conducted for both the college boy and for the industrial boy—or rather every boy is given a chance to combine the culture of the shop and drawing room with that of the recitation room and of the laboratory, and the stigma of ignorance on the one hand and the charge of practical unhandiness on the other is no longer just.

Hail to the skillful, cunning hand!  
Hail to the cultured mind!  
Contending for the world's command,  
Here let them be combined.

Such is the doctrine at the present time. The industrial student should see to it that the two are "combined."

All knowledge, science, and art are not written in books, but much of them is. Good books are a mine of wealth, and every aspiring lad should learn to read and study them. Not shallow, silly stories of flashy, sportive boys, and boy-dens, unwomanly girls; but true histories and true biographies of great men and women—inventors, engineers, artists,

reformers, statesmen, and authors. Nothing more adorns a good workman than correct speech and graceful composition, just as nothing more quickly condemns a young man untaught and unworthy than bad English speech and wretched composition. Let pupils and teachers keep these words in mind.

**Whims and Fancies Are Dangerous.**—

Finally it is a sad mistake to take seriously a boy's early whim as to what he shall study and what he may neglect; just as it is wrong for a parent to persist in training his son to a predestined career—without an adequate knowledge of the lad's mind and natural bent. Great engineers, inventors, general managers and teachers, are as truly "born, and not made" as are poets, artists, and orators. It is the function of the school not only to develop the whole boy, but to discover in which direction that development may be most fruitful in character and usefulness.

**Technological Training** is for young men of strong, clear minds, who have a desire to master and apply mathematics and the principles of science to the practical affairs of modern life. Such men are ambitious to become engineers or architects, to build bridges, to plan and construct public works, and to organize and administer manufacturing plants, which shall embody the latest discoveries of science, the best styles of construction, and the best methods of securing economy and efficiency of operation. The accomplished engineer is well educated; he is no mere engine driver, or ordinary mechanic. He can, of course, if there be need, manage an engine, and he can use fairly well every tool in the shop; yet his chief function is to do the head-work involved in preparing plans and specifications, and in directing, supervising, and inspecting the work of construction. Technological training is the logical outcome of manual training, though by no means the only outcome, since all doors are open to the boy who has completed the full manual training course of correlated studies.

**To Be an Engineer,** a boy should absorb all that the secondary school can give in the way of mathematics, physics, chemistry, English, manual training, and drawing. If history and French can be added, so much the better.

Then he should enter a high-grade technical school with excellent engineering laboratories, in which the constructive

properties of engineering materials may be learned from actual tests, and in which typical engineering appliances and operations may be studied and made familiar.

All advanced work begins with a design; and that design is based upon the properties of the materials used, as well as upon the end to be attained. The physical properties must include strength and elasticity as well as beauty and durability; and a scientific designer must be able to calculate the stress in every individual member of a construction, and just the forms needed to have the necessary strength and stability. All these calculations involve the principles of mechanics which are expressed in the language of mathematics far beyond the range of grammar and high schools.

To be a technical man worthy of the name one must master first the so-called higher mathematics, and then he must master applied mechanics, which deal with force; the stability of structures and frames; the motion of heavy bodies; the development, transmission, and utilization of energy—all of which are expressed in mathematical terms.

**Technical Terms Must Be Understood.**—

Nothing is more important than the exact meaning of technical words and the precise meaning of mechanical and engineering units. We are all pretty familiar with such units as a *pound*, a *foot*, a *horse-power*, and a *second*; the engineer must be equally familiar with a *moment*, a *radius of gyration*, a *kilogram*, a *meter*, a *volt*, an *ampere*, a *watt*, etc.; and this familiarity can be gained only by study and practical use.

All this cannot be learned and comprehended by merely reading formulas and definitions in books. Moreover these things take time. One is not an accomplished engineer by birth, nor in a single session of a winter school, nor by working in a shop. Such matters help, but they do not suffice. Innate capacity is an essential; a single term under good guidance may open the door and give one a good start; a shop and a field party may be very useful in getting at the full meaning of terms and in learning how things are done. But the language of mathematics and applied science requires time, steady work, and mental growth. Every boy should get seven or eight years of such growth in high school and engineering college, if he aims at superiority.



## NORMAL SCHOOLS

tions that are organized and conducted for the special purpose of training teachers are called normal schools. Their entire work consists of educating and training men and women for professional careers as teachers in public, parochial and private schools of kindergarten, primary, elementary and secondary grades. The majority of such schools are founded and maintained by the states, and since these are so well supported and so efficiently managed, they determine

the standards and the character of work required of all institutions that adopt this name. These schools require of students the study of scholastic and professional branches of knowledge that are essential to the vocation of teaching, and in addition exact specific training of the capability to teach by giving opportunity to put into practice the knowledge and the theories they are taught.

**Other Names.**—The name "state normal school" is commonly given this class of educational institution, but in some states other titles are used to designate that they are teachers' training schools, such as "state

normal college," "state teachers' college" and "state normal university." When these latter names are used it is intended to imply that such institutions are of somewhat higher grade or are organized on a more elaborate plan or are assigned a larger province than those designated as state normal schools. While this is the inference, the fact still remains that the extent of the province and the size of the opportunity to be finally assigned these educational institutions have not been absolutely determined, as the years of the movement have not yet been many enough, and public experience has not yet been extended enough, to determine the scope and the province that the governmental need demands.

**Organization.**—The function of the normal schools has been more largely determined by statute than by custom. Their province has been created to meet a definite, emergent condition found in the development of universal education, and their development has been of a character and of a kind that are much different from those of the college and of the university. They came into existence by the order of legislative assemblies in response to public demand for amelioration of prominent difficulties in the teacher-supply problem, and they were given immediately a support, an authority and an opportunity that no other kind of public educational institution had ever had. They were at once recognized as necessities rather than possibilities, and they opened up a special opportunity to prepare for a vocation that gave promise of permanent occupation and reasonable self-support. These conditions insured an immediate patronage, an unusual popularity and an unprecedented success, since everything contributed to make their work vocational, practical and acceptable.

**Board of Management.**—They were organized in conformity to custom, the legislatures providing boards of management that were authorized to expend the appropriations for financial support that were granted, and to provide ways and means for the proper conduct of the work desired. These boards had supervisory rather than executive control, and hence provided a faculty of scholarly, skilled teachers to have direct control and management of these institutions.

**Faculty.**—They appointed a president, determined the departments, employed professors, assistant professors, instructors and assistants, adopted general regulations governing faculties and students, authorized courses of study that gave promise of meeting the requirements of public demand for well-educated and well-trained teachers and provided the conditions that should be enforced in admitting, instructing, training and graduating students. The system of management has been very similar to that instituted in colleges and universities, but yet decidedly different, in that it depended upon a more limited program of studies, avoided the tendency to extreme election of lines of work by the students and emphasized the instruction as being specially given to prepare students for a single vocation.

**Function.**—These schools have varied much as regards their interpretation of the function assigned, but they have never been permitted to depart from the true purpose that was assigned by legislative act. Their immediate popularity and prominent success were so notable that other institutions that were organized for cultural and

disciplinary education, and whose aim was training for life rather than for special vocation, decided to take advantage of the wave of popular favor and secure for themselves a part of the young men and women that were desiring to enter the business of public school teaching.

**College Ideals.**—To accomplish this, courses of study were planned that were in imitation of those offered by normal schools, but that were less practical and less vocational, in fact, because they depended entirely upon lectures and class instruction and ignored the notion of actual training in teaching through a specially organized training school.

**Duplication of Effort.**—This duplication of endeavor has founded schools of education, departments of pedagogy, chairs of didactic, and teachers' colleges as parts of courses offered for bachelors' degrees in colleges and universities, and has also led to organizing schools for teacher-training of secondary educational rank that are more local than regular state schools and that are named junior normal schools, county normal schools, city normal schools, city training classes or similar designations that undertake to show that they limit their education and training to elementary teacher preparation of a very moderate quality or grade.

**Variations.**—Since this class of institutions came into existence by legislation in the several states, since they are all products of an endeavor since 1839, since the different states were themselves in a much different condition of organization, settlement and development at the time of founding, such institutions, there would be much need of variation in their plans, their intended scope of endeavor and their claims for recognition.

**First Type.**—In the older states endowed colleges and universities, independent of state control, were organized and maintained on excellent standards before the normal school conception of teacher-training was developed. In such states the normal school became a supplementary institution to do an educational work that was omitted and overlooked by the system in existence.

**Second Type.**—In the newer states higher education was unsettled and undeveloped because of the rapid settlement and expansion of territory at this time and, hence, such states not only founded normal schools but also state universities and state colleges of agriculture and mechanic arts. Here the normal schools have become institutions in every sense of the word and have gained a rank and a success that is not inferior to that held by the other institutions of higher learning.

**The Typical Normal School.**—Although the state systems have developed a normal school particularly adapted to the actual need of the individual state, yet there is much in common that differentiates them as a class from all other kinds of higher and secondary education. The typical normal school is both a higher institution and a secondary institution, if by these terms are meant the standard of scholarship possessed by their students on being admitted to begin work, and if certain branches of study commonly taught in high schools are classified as secondary studies. All normal schools have in their courses of instruction branches of study that are commonly found only in colleges and also branches of study that are commonly found only in high schools.

**Reason Given.**—This is due to the fact that their function is that of preparing teachers

for public schools. Hence these normal schools must admit to their courses persons who are now licensed teachers in the states where they are located and that have maturity, experience in teaching and development of personality, and who by such instruction are enabled to be better prepared for the business they are following.

**Teachers in Service.**—This class of workers is very large in numbers in the majority of the states. Not having had opportunity or financial means to go to either high school or college they have begun teaching as soon as they reached the age limit set by law and were able to pass the scholastic examination that is legally required for a teacher's certificate. This actual state of affairs has made the normal schools conduct their work to comply with a condition rather than to seek to respond to some line theories regarding what persons ought to be authorized to be teachers. They found the teachers in service needing to be improved, and they have met this demand as fully as time and means and attendance could make it possible.

**City Demand.**—In addition, there has been a growing sentiment in cities and towns that teachers should be educated and trained before being admitted to the public service. These cities and towns, being independent of state or county control, more or less set their own standards of teacher-education and demand certain qualifications beyond high-school education of all candidates who sought employment. Many of them said it was necessary for all these teachers to be either normal-school or college graduates.

**Expansion of Field.**—This standard requirement enabled the normal schools to offer courses of instruction and varieties of work that belong to college student ages and preparation, and in this way young ladies and gentlemen who were inexperienced in teaching and who desired to be specially prepared for such work found a place in this class of institutions. They are taught in separate classes from the practical teachers, they are given scholastic subjects of college-grade rank, they are given different instruction in the science of teaching, and they are given laboratory work in the actual teaching of children that is specially adapted to the specific kind of educational work they have decided to undertake.

**The Two Phases of Work.**—As a consequence of these conditions normal schools are practically conducted as schools with two distinct divisions of work, from either of which students of right age and development may graduate, each kind being equivalently prepared for the career they desire to follow. The fully mature, experienced, practical men and women can be given an education that fits them at their time of life for the most effective and specific service, without taking the number of years in preparation that a child would necessarily be obliged to take who entered the kindergarten and followed the standard curriculum of the primary, elementary and secondary school to the end, graduating at about seventeen years of age.

**The Mature Student.**—The individual who desires education after childhood and youth have passed is not adapted mentally to either the methods of instruction, the progress of the work or the details of information that are deemed suitable to those of younger years. For that reason the

normal school provides for such the instruction and the training that are demanded by their age and development. To such students the taking of such branches as algebra, geometry, rhetoric and botany is quite a different task from what it is to the pupils of the secondary school age. To meet this situation the normal school adapts these studies to the educating of the mature mind and the college age development that such students possess, and it has found such instruction to possess the highest value and to be of the largest importance in securing the results sought—a well balanced and a thoroughly trained mind.

**The Scholarastically Trained.**—In like manner with students who have had standard high school preparation and training. They are different in their knowledge, they are keener in their scholarship, they are more accurate in their language, they are more ready in their student-ship, and these things require that they be treated as students of full college grade. They are not usually trained for high-school department work, for the kindergarten and for primary grades, they have more breadth of possibility in foreign languages because they began them in youth; they have more versatility of possibility of after occupation, but they are no more likely to become prominent in executive work as educators nor in distinction in success in many fields of teacher business than the first class of students, known as practical teachers. Under the conditions that exist in the teacher-supply situation the normal schools have no choice as public institutions but to do all they can to produce a supply of trained persons to meet the demand that the public service constantly makes.

**Conditions of Admission.**—The standards of admission that are enforced as especially belonging to a teacher's training school are such characteristics as (1) age, (2) experience in teaching, and (3) scholarship possessed. Of these age is particularly of great importance, since the preparation for such a vocation demands full maturity of mind, a thorough conception of what is being undertaken in getting ready for a career and a serious attitude toward the work that is essential to be done. Experience in giving instruction has large value in increasing the importance of obtaining a full mastery of the subjects of study assigned and of keeping in possession for service the knowledge that is gained. A teacher-student learning that this he is to use and that he should in no case forget, and hence he realizes the practical nature of the instruction he receives and he gives devoted attention to both the apprehension and the comprehension of the work pursued.

**Intention to Teach.**—Other conditions of admission are particularly important and are equally essential to the best system of training for the business of teaching. These are such as (1) intention to teach in the schools of the state, (2) intention to complete a course of study in the school, and (3) intention to keep the requirements of the school faithfully and fully. There is a spirit of determination to accomplish something notably good by being somebody exceptionally worthy and capable that has much to do in making the training for the profession all it should be. Many students attend the normal schools for so

short a time, they acquire so little of the spirit there infused, they receive such a small amount of education, that such schools are not responsible for their qualifications or for their suitability. It is such persons as these that depreciate the importance and the reality of normal-school training, because they frequently pose to represent what they are not and could not be.

**Personal Qualities.**—In addition to these enforceable conditions, there are some things that are equally important but not so easily ascertained, yet on them depends after all much that determines the actual quality of a teacher and that makes the training effective. These things are (1) freedom from disease or infirmity that would unfit a person for the office of teacher, (2) a good moral character that establishes the fact that the person will exert a wholesome spiritual influence upon the lives of children, and (3) personal adaptability that must be possessed by nature. The investigation that will determine these things is always uncertain and unreliable, as it depends upon symptoms and sources of information that are often temporary, indeterminate and unreliable.

**Form of Admission.**—There are three forms of admission that are commonly accepted as sufficient, and all of them are in force. They are (1) holding a teacher's certificate or license to teach or experience in teaching of three years' standing, (2) credentials granted by college-entrance examining boards, by state boards of education or by accredited high-school faculties, (3) proofs of scholarship established by an examination equivalent to the requirements adopted by the literary and scientific bodies empowered to grant credentials of admission. Such formal examinations are given by the normal-school faculties.

**Value of Systems.**—Of all these methods of admission the second is so universal that the third is growing to be less and less a method that is essential to the system. In the certificate and credentials system the student is received on trial and given an opportunity to establish the strength of his preparation before being permanently accepted as a student of the normal school. In case students do not show that their training and scholarship are equivalent to the credentials filed, the secondary school and governing board are notified of the failure to meet the standard expected in order to inform them of the results of such student entrance.

**Success of Students.**—In like manner success is always reported and complete information is thus given regarding all beginning students to those responsible for recommending them. Since the formation of the college and secondary school associations of the United States, each state has some system of secondary school inspection in which account is taken of equipment, instruction, management and effectiveness, and thus a standard of uniformity of education and equality of instruction has been secured.

**Requisites Secured.**—There are certain requisites that are fundamental to thorough, efficient, capable teacher training. Among these the more vital to success are the following:

**Spirit.**—The student must be inspired with the spirit of the true teacher, being endowed with an evangelism which enables him to realize that the work assigned him is of permanent and definite importance.

It is absolutely necessary to awaken in him full appreciation of the actual value of the calling to the world. He must feel the claims of service, ardently love his pupils, recognize the mission of uplift and improvement that he undertakes, and labor to secure an inward condition of attitude in his pupils toward the best things in civilization so "that they may have life more abundantly."

**Scope of Work.**—The student must be carefully and sympathetically led through the educational study of the public school in all its phases, in order that he may acquire the teaching process for these ages and thereby become habituated to a condition of mind in reference to all knowledge such that the teaching process becomes to him a natural outcome producing a personal attitude that is harmonious and helpful. It is thus that the normal school becomes professional in its influence and training, conducting the educational study of subjects from the standpoint of the teaching process so that there is produced a broader view of the scope and meaning of training a human soul.

**Study of Man.**—The student must be directed in making a broad, intensive study of what constitutes man, the body, the mind and the soul. This is undertaken to establish clearly the principles of education which underlie all capable and practical instruction. The learning to be a teacher is to acquire a professional attitude and condition, and this training must never degenerate into the qualities of a trade where devices, methods and other mechanical means are considered as training in teaching. The true teacher is a person, not a mechanic; he is an artist, not an artisan; he needs these qualities to work upon the individualities he is aiming to educate, for without them he is incapable for the task imposed.

**Child Nature.**—The student must be given abundant opportunity to develop his understanding of child activities, child development and child life by a practical study of children. He must master the art of interesting them, of managing them and of inspiring them to noble and grand efforts. He must acquire an intelligent conception of the differences that continually exist in pupils that are taught, while through sympathy, suggestion and benevolent supervision he must develop latent power, unknown capabilities and unappreciated values of personality.

**The Relation to the People.**—The normal schools are notable for their being in such close sympathy with the masses. This is due to their province, their patronage, their immediate response to public demand and their recognition of the realities and possibilities of public service from an institutional standpoint. They were founded in direct opposition to the commonly accepted theory of higher education and for that reason they did not receive recognition from other higher institutions of learning without long consideration and discussion. They were accused of not valuing collegiate standards and scholastic ideas and hence a barrier had to pass before their graduates were received at colleges and universities as being possessed of knowledge that was equivalent to that offered by the old standard courses. The progress of elective studies in these colleges, as well as the prominence in public appreciation received by the normal-school graduates for capa-

bility of service and independence of thought and action, finally brought about a great change in the sentiment of college faculties, until to-day these graduates are received with notable favor and consideration by the greater universities.

**Schools of the Masses.**—There is no aristocracy except of character and capability among the student bodies of these normal schools. This is due to the fact that they are largely patronized by the children of the common people. They are obliged to depend upon their own personal endeavors for self-support and they possess a self-reliance and a self-confidence that are of the greatest value. These normal schools are, then, the schools for the masses in general, as they are so organized that any one can enter somewhere in the courses offered for the public service and are diligently trained and thoroughly prepared to do their duty in an admirable and acceptable manner.

**Self-Reliance Obtained.**—The extreme practical nature of these training schools has developed in them an independent, reliant class of workers that has secured for them a popularity and an acceptance by the public that is very exceptional. The rapid development of this kind of education and training in the different states of the Union has been caused by the people as a whole, in order that they may be able to secure more efficiency in their teachers, since experience has shown that these normal schools were definite, positive and immediate in their actual excellence as fitting schools for a notable occupation.

**Popularity of the Work.**—As a consequence, the popular will continues in favor of the expansion of the system of teacher training under public control, and every meeting of every general assembly of every state takes time and opportunity in endeavoring to ascertain in what way the progress of such work can be improved. It is thus that more new institutions are established, that other classes and grades of teacher training are authorized, more progress of work in the older schools is permitted, and the budgets of support are greatly increased, seeking the day when an intelligent, trained, skilled teacher shall be in charge of even the humblest and most remote schools that are found in the rural communities.

**The Expanding Province.**—The province of the normal schools has expanded in harmony with the expansion of the course of study offered by the public schools. It has also been compelled to differentiate its courses to suit the differentiation that has occurred in public school teaching. As teachers became in demand for specialization in definite lines of study and training so the normal school offered special teacher training to suit these particular demands. As teachers' certificates were raised in standard in the several states so the normal school branches of study were modified to suit the new conditions.

**Special Training.**—It is thus that the normal school graduate of to-day is specially prepared to do some specific line of teaching and the general teacher of half a century ago is now not found anywhere except in the ungraded district school, and even there the higher grades of work are rarely found any more, since these schools are now limited to the primary and elementary grades. The consolidation of schools, the introduction of the interurban electric railway, the improvement of transportation and many other causes have contributed to expand the normal school

into an institution where teachers are trained for many special fields of professional work. It is for this reason that the preparation and training of general teachers are not now desirable, since progress has compelled the normal school to reorganize its courses of study and adapt them to modern conditions where the special teacher and the expert are required.

**Modern Notions.**—The normal school of to-day that does not prepare special teachers for the kindergarten, the primary grade, the upper grade work, high school department work, public school music work, manual training, domestic science, physical training, agriculture, domestic art and other particular phases of public education is not a modern school at all and fails to fill the province in teacher training that present-day civilization exacts. Such institutions attempt to follow the law of public demand and do not undertake to decide what should be refused to popular demand and what education is the kind of education that the present civilization needs. They accept the policy that the people of a democracy are capable to decide what they want done and what they are willing to support financially and that it is the chief business of the teacher schools to subordinate themselves to the popular will.

**The Larger Service.**—The normal school of collegiate grade alone can well afford to limit its field of endeavor to the preparation of the kind of teachers needed in village and city school systems and in addition prepare high-school teachers, critic teachers, supervisors of special work, principals and superintendents, as such classes are in great constant demand, but the normal school of secondary grade just as well serves today and generation when it meets the needs of the district schools and trains teachers who are able to prepare the industrial classes for earning better incomes and for the ability to more decidedly enjoy simpler life and purer happiness than would otherwise be possible.

**Modifications in Type.**—The United States covers much latitude and longitude. It possesses great varieties of conditions in public-school requirements and standards. This accounts for the several types of normal schools that have appeared and that are now in existence in the Union. These types may be reduced to five general classes, giving a situation that enables them to be easily understood and comprehended for their individuality. These are the Southern states normal school, the Middle states normal school, the North Central states normal school, the Pacific states normal school and the New England normal school. Each class of these is unique in certain particulars, as it fits its own environment and fills completely the task assigned.

**Vitality.**—These all have shown unusual vitality as educational institutions and have had a marked effect in convincing the colleges and universities that the preparation of public-school teachers was large enough a professional business for them to accept a part of the task imposed. As a consequence there has been a notable change in the last twenty-five years as to policies and plans in the colleges and universities, so that no notable or prominent institution of such class is now conducted without its department or school of education.

**The Courses of Study.**—The preparation of a teacher that is thoroughly adapted to his work requires that he have a working knowledge of the several branches of

study that civilization has adopted as constants in public school education. The normal school recognizes that this selection is very definitely decided, and hence it sets itself to the task of efficiently meeting this requirement. This knowledge of the school courses is assumed to be fundamental and essential to the common life of the people and from that principle the work of teacher education is carefully planned.

**The Way to Teach.**—The normal school undertakes the task of determining the right and best way of teaching these subjects with the use of the least time and effort. It accomplishes the instruction of would-be teachers so as to give them a thorough mastery of the content of the adopted branches of study, while the practical use of this knowledge in the conduct of the school work is also fully realized. It is here that model work as an instructor is attempted to be shown, that definite ideals of educational effort are attempted to be established, that the philosophy of success in instruction is developed and that the spirit of interest is aroused, enlarged, individualized and exemplified. With this interpretation of the object to be attained by normal-school instruction and training the following typical courses are given:

**MINIMUM COURSE.**—Entrance Conditions.—Knowledge of the fundamental branches required by teachers' certificates; arithmetic, English grammar, geography, history of the United States, reading, penmanship, physiology and hygiene, vocal music, orthography, civil government, economics, elementary algebra and elementary physics. These subjects may be certified to by the state examining board or be proven by taking an examination given by the normal school. For students of sufficient age to be teachers these studies are preparatory subjects for the state examination for elementary teachers' certificates but are not a part of the course required for graduation except as they are required for entrance.

**Branches Included in the Minimum Course.**—Three years of work of nine months each, leading to a diploma and a state teacher's certificate.

**MATHEMATICS.**—(1) Algebra. (2) Geometry. **LANGUAGE.**—(1) Latin or German three years. (2) Rhetoric.

**SOCIAL SCIENCE.**—(1) American History. (2) General History. (3) Economics. (4) American Government.

**LITERATURE.**—(1) Folklore and Myth. (2) American Literature. (3) English Literature. **SCIENCE.**—(1) Physics. (2) Botany. (3) Sanitation. (4) Zoology or Geology.

**PHYSICAL EDUCATION.**—(1) Physical Training two years. (2) Lectures on personal hygiene. (3) Games and Playground Work.

**ART.**—(1) Elocution. (2) Drawing. (3) Form, Color and Design.

**ENGLISH LANGUAGE PRACTICE.**—(1) Literary Society work—two years under supervision and criticism. (2) Oratory and Debating. (3) Dramatic Work.

**PROFESSIONAL WORK.**—(1) Psychology. (2) School Management. (3) History of Education. (4) Observation of the public-school work. (5) Teaching in Training School.

**MAXIMUM COURSE.**—Entrance Conditions.—Graduation from a four year accredited high school, inspected and approved by the state as a suitable preparatory school. Credentials received from these accredited high schools on certificate signed by the principal of the high school.

**Branches Included in the Maximum Course.**—Four years of work of nine months each, leading to a degree equivalent to the college degree bachelor of arts, and an honorary first-grade state certificate.

**Required Work for Completing Course.**—1. It is necessary for a student to take as a major study two years of professional instruction in education, which includes psychology, school management, history of education, philosophy of education and American education. This work covers







## HIGHER EDUCATION

### Origin and Purpose.—

The first colleges founded in America, Harvard in 1636, William and Mary in 1693, and Yale in 1701, and, after the lapse of half a century, Princeton and Dartmouth and Brown, were founded with a practical purpose. They were founded to train ministers for the churches of their ecclesiastical order.

### Vocational Training a Constant Purpose.—

This vocational aim has continued, with certain changes. These changes have consisted, first, in the change of the vocation itself, and second, in the substitution or addition of the general purpose of culture or of intellectual training. The clerical aim was maintained till the first decades of the nineteenth century. It was supplanted by the professional purpose of training lawyers, although this purpose never became so consciously dominant as it was in the case of the clerical education. The legal purpose continued up to the later decades of the same century, when it was found that an increasing number of graduates, amounting in the case of some conspicuous colleges to a majority, were entering business. The practical and vocational work of the college education, therefore, has from the beginning been more prominent than is usually thought.

The practical work is also indicated in the changes which have been wrought in the course of study in the progress of two hundred seventy-five years. That course was originally linguistic and philo-epic, consisting largely of Latin, Greek and Hebrew. It was a prolongation of the Oxford and Cambridge tradition. The embellishments of the middle ages, for better or for worse, dominated. The curriculum has, during most three centuries by successive enlargements, come to include almost every intellectual interest. In fact, the history of the curriculum is a history of academic enlargement created by the enlargement of man's knowledge. Scientific studies have been introduced by reason of the demand of the community quite as much as by academic necessities. Economic and social studies have been included as the result of the deepening concern of society in its own fundamental problems. It is significant that the great growth in the instruction offered in the language and literature of Spain followed immediately upon the conclusion of the war of the United States with that nation.

The chief question, however, to be considered is the elements which constitute the practical worth of a college education.

### Develops Power of Thinking.—

A college education broadens, deepens, heightens the power of thinking. This worth is fundamental and comprehensive. The higher education does enlarge the knowledge possessed by the student. But this worth is slight in comparison with the value of the increase of the power of thought. In fact, the process of gaining knowledge is for the student of higher value than the product of the knowledge gained. The knowledge itself vanishes; but the process of accurate,

thorough, comprehensive learning, becoming a part of the student's intellectual equipment, represents a power of thinking of incalculable worth. For the power of thinking stands for reasoning, judgment, the assessment of a fact at a just value, the relation of fact to fact, of truth to truth, and the inferring of new truths and new facts. It stands for the power to unravel a tangled skein of false and true argumentation, the drawing out of the separate threads of a commingled discourse, and the laying of them out in proper order and proportion. It means the appreciation of the great as great, of the small as small, of the lasting as lasting, of the transient as brief, of the limited as narrow, and of the universal as universal. In a word, the power to think means intellectual valuations and appreciation of intellectual relationships.

Now this power has the highest practical worth. It represents the filling of a fundamental need of the American character and of the American community. The new world has, for its dominant characteristic, energy. Its climate or its political conditions or other forces have made the American nation the most energetic nation. But its energy has not been well utilized, its forces have been too largely either wasted or abused. The nation has not been distinguished by its large and sane power of judgment. A proper and practical purpose of the American college should be to make this power of judgment worthy of the new world's energy.

### Promotes Self-Knowledge.—

A practical worth of a college education lies in its power of promoting the self-knowledge of the individual student, with a view of the proper choice on his part of a vocation. A large proportion of men think that they have not chosen a proper calling. Such a mistake results in both unhappiness and inefficiency. A college education prompts a man to defer the choice of a calling to a period later than that at which he would choose a life's calling were he living at the age of eighteen outside college walls. Through the acquiring of knowledge, through an increasing acquaintance with his fellows, through enlarged thoughtfulness on his own part, he comes into more complete obedience to the Greek maxim of knowing himself. Said the graduate of a technical school on the day of his graduation, "I now know that I do not want to be a mechanical engineer. I know I want to be a lawyer." If, however, he had given himself the advantage of a liberal education before taking up the study of a professional education, he would probably have been saved from this waste of time, force, and money. In fact, the higher education gives a man the opportunity of making mistakes which every young man must make in a small area and with slight consequent harm, which otherwise he might make in a large domain and with dire results.

### Promotes Friendship.—

A highly practical value of a college education is also found in its power for making friendships. The power of friendship, as a joy and a personal satisfaction, has been written about since

the time of Cicero and before; but the worth of friendship as a practical concern does represent a great collegiate asset. A man makes more friends and more lasting ones in college than during all his subsequent life. Youth is the time for making friendships—the college age is the age of youth.

Friendship stands for personal intimacy in both process and result—the college place and time are the time and place of intimacy. "In Memoriam" is based upon a college friendship. Lowell's greatest ode gets at least a part of its immortality from the inspiration of college friendships. Now, such friendships promote the forming of relationships of all kinds. Nations trade with nations that are friendly. Individuals do business with individuals that are friends. Men are recommended by and are selected by other men for great places because they are known through friendship. It has been said it is worth while to go to college simply to make friends. In this sense it is a commercial and an industrial value.

### Gives Facility.—

A college education also promotes facility in the individual student. It enlarges his power of doing, and of doing with ease what belongs to him to do. It saves him from the rule of thumb. It delivers him unto the rule of a general principle. It helps him to see what needs to be done in any given case, it helps him to find the force necessary for the doing, it helps him to protect his cause and himself from the necessary perils of his doing, and also helps him to relate properly the consequences of his doing to other forces and conditions. In a very practical way it may at once be said that the higher education increases the earning capacity of each graduate. Given the case of two men, the one entering business immediately on the completion of his high-school course, the other entering business at the completion of his college course. In point of time the high school boy has the start by four years of the college man. The college man begins his life work at practically the very same point where the high school boy began his four years before. But experience proves that when the college man has been at work for two years he will have come up to the high school boy, and in the course of the third year of his apprenticeship he will have passed the high school boy. When once he has passed him, competition has ceased. The college man goes into relationships and developments of his business into which the high school boy cannot, and knows he cannot, enter. One of the greatest retail houses in this country, composed largely of members of the same family, recently entered into an agreement with its own partners that sons and nephews who gave themselves the advantage of a liberal education should receive special advantages and have open to them special opportunities for advancement. Great business men there are who are not college graduates, of course. Nature endowed them with larger powers even without the gift of a liberal education than most men possess. But it is significant that these same men are sending their sons to college, and are doing more to send the sons of other men to college than anybody else in the community.

### Lifts Level of Self-Development.—

Carrying out this same principle of facility it should also be said that education gives a man a higher limit of individual development. It lays the foundation of

his life and character wider and deeper, and it permits a higher and broader superstructure. It is recognized by ethnologists that certain races or tribes more speedily reach the limit of their normal growth than others. The white race prides itself upon its belief that its limit of development is more remote than the limit of other peoples. Education removes limitations. It helps the individual to do more things and each of these things better. It increases general power and thus reinforces special aptitudes. As the physicist often finds he can pursue no further certain researches without greater mathematical knowledge, so the lawyer or the doctor finds that he cannot become a better practitioner without a richer and more simple endowed character. This general endowment enlarges his professional field of service.

**Promotes Higher Service.**—A further element of the practical worth of the higher education, and not entirely unlike that just considered, may be said to lie in the capacity of being inspired to do something worth while. If this capacity exist at all in a man, it is necessary that it should be called out. If it is not called out, it becomes paralyzed or dead. The college is the force and condition best fitted to evoke it into being. College acquaints a man with the great historic movements, political, ecclesiastical, literary. It demands a knowledge of the best books. It might be said that a college is a collection of the best books about the most important subjects. A college represents, too, great teachers and great scholars. In the body of students, moreover, of the college are found souls who, though young in years, are great in radiant hope and promise. Through such forces and conditions the student is inspired to do something worth while, if that capacity exist at all in him. What the greatest have thought of and aspired after, he may think of and aspire after. What the strongest have achieved may be made the not unworthy object of his ambition. Such a coming to one's self is of the highest practical worth. It represents the dawn of a new world.

**Promotes Professional Interests.**—In quite an opposite respect, and one somewhat narrow, college education has special value for the proper entrance upon a profession. Entrance to the clerical profession has usually been conditioned upon being a college graduate. Entrance upon the legal or medical profession has been exceedingly loose. State boards have in most cases admitted candidates to the practice of law or of medicine upon the presentation of an easily obtained certificate of good moral character and upon passing simplest examinations. Law schools and medical schools have required for entrance in most cases knowledge not exceeding that represented in a high-school diploma. But a great change is now occurring. Several medical schools and law schools are requiring at least two years of college work for admission, and those of each type require the B. A., or B. S., degree. The simple fact is that a student cannot enter the best professional schools unless he be a graduate. It is not unfitting to add that such a requirement represents the increased respect which a community is coming to hold for its members, and also represents the increasing power of the community to give a proper pecuniary compensation to those who protect its hygienic and legal rights.

**Develops the Gentleman.**—A further practical advantage of a college education lies in its development of the gentleman. There are graduates who are not gentlemen and there are, many men who are gentlemen who have never passed within college gateways. But a normal result of residence for four years within these gateways is the making of a gentleman. The gentleman represents self-respect without bombastness, an intellect without narrow interpretation of a social condition, a discernment of the duty of putting others before himself, and finding pleasure in such self-negation, and the use of the happy art of giving pleasure to others, whoever, whatever, and wherever they may be. The gentleman represents the man of good manners. Good manners are of a greater consequence in one's career than is usually believed. With them and with other qualities in even a moderate degree one can be assured of a certain kind of success in a career. Without them great qualities and elements of character are vitiated.

Now the college trains the gentleman. The attrition of intimate and long-continued association rubs down the angles of individual idiosyncrasies. The necessity of obedience to formal rules disciplines humility. The presence of worthy examples of gentle manliness among students and teachers and associates prompts the formation of the same great qualities in one's self.

**Trains for Leadership.**—The ninth and last practical advantage of which I shall write lies in a somewhat different field from the advantages already noted. These advantages already noted have largely concerned the individual. The present advantage has special concern for the whole community. I refer to the need of the community of great leadership. Democracies tend to approach to and to rest upon the level of the commonplace. They have to do with the well-being of the great body of the people. They find it difficult to create, to develop, and to train the unusual man.

It is the unusual man, what the naturalists call a "sport," whom a democratic community most urgently needs. It needs sane, large, inspiring leaderships. Such leaderships the college should train. Such leadership means the having of a well-trained brain, of a sympathetic heart, appreciative, firm, loving; of a will, strong, great, guided by a proper intelligence; of a conscience which incarnates righteousness. The college is established to train the brain, to enlarge the heart, to strengthen the will, and to purify the conscience in righteousness. Such leadership the American community has received from college graduates since the foundation of the first college; and to the training of men who embody qualities of such leadership the college is devoting itself with increasing energy and wisdom.

The means which the college uses in securing these great practical results may be summed up in three phrases: truth, men, undergraduate activities.

In this development truth is fundamental. *Veritas* is found upon the shield of the oldest American college; and this word, together with *Lux*, is the word most commonly found upon the shield of American colleges. The book and the lecture are the universal types of truth in literature, truth in science (natural, physical, social), truth in history, in mathematics, and in language, form the study

of the college. Truth is the food of the mind. By its mind is fed, grows, develops. It is the fundamental cause or condition of the practical worth of the higher education.

**Uses Truth and Men.**—With truth is to be united personality. Man makes man. The teacher enlarges, inspires the student more than the text-book. The influence of the teacher over student within and without the classroom is one of the mightiest forces in the American college. There is some reason to believe that it has been a mightier force than it now is. The enlargement of the vast field of truth and the claims of this field upon the student have seemed to limit or to lessen the personal power of the teacher. But it is still recognized that herein lies a rich opportunity for the college professor, if he wishes to avail himself of it. If the student is to get the best results from his college, he should find quickening influences in the person of his intellectual superior.

**Undergraduate Activities.**—A third force which the college uses in securing great practical worth for its education lies in the activities of the undergraduates themselves. These activities have in the last decades become numerous, diverse, and absorbing. In certain larger colleges these activities are represented in no less than a hundred organizations, societies, or clubs. They are social and fraternal, such as the Greek letter societies; they are athletic, such as football clubs, baseball clubs, tennis clubs, shooting clubs; they are musical, such as singing, mandolin, and banjo clubs; they are literary, such as debating and reading clubs. The religious work of the undergraduate represents one of the most important forms of this development.

The Young Men's Christian Association has supplanted the old society of religious inquiry and undertaken to do manifold works for and through its members. These works include, not only welcoming new students, seeking to adjust them to an unknown environment, and trying to aid them in getting the best results out of college life, but also carrying on missions in jails, teaching English to newly arrived foreigners, and even bearing an important part in the manifold and diverse work of a college settlement. In fact, the activities of undergraduates have become so numerous and so compelling that there is some reason to believe that the term student applied to them is a misnomer. But it is certainly true that these activities give an excellent training for a subsequent life of a citizen or a professional. The mercantile or industrial record, for instance, made by many men who played ball in college or who were managers of their teams, gives evidence of the worth of this type of undergraduate training.

**Pecuniary Relations.**—The pecuniary condition attending the college giving and the student receiving such an education is important. The higher education is everywhere a charity or a gift. No student pays for his education. The tuition fee, seldom exceeding \$150 a year, seldom falling below \$50 a year except in the case of some state universities, represents only a share of the entire cost of the education of the individual student. The proportion runs from perhaps one-half to one-quarter. The balance is paid for out of the interest of endowment funds which have usually been the result of either a gift or bequest. In the state universities the balance of cost not paid by the students is met out

of appropriations made by the legislature of the state, which appropriations are usually the result of general taxation. The American community has, either in its organized or in its unorganized capacity, found its advantage in not to charge the whole amount of the cost of higher education to the individuals actually receiving it. It has come to the conclusion, perhaps more unconsciously than consciously, that it will get its pay back in service from the men whom it thus freely educates.

**Promotes Research.**—The practical advantages which have so far been considered as the result of the higher education have related to the training of men. But there are advantages which lie in another plane. These advantages are summed up in the word *research*. The college and university have become in no small sense great research laboratories. These laboratories have devoted themselves to practical concerns. Professor Bell, the inventor of the telephone, said to Helmholtz on the occasion of his visit to America in 1893 that it was the laws which the great German discovered in sound which led to his invention of the telephone. Scientific research in Germany and America has usually been conducted in college laboratories. Scientific research in England has commonly been carried on in private laboratories. Darwin is the striking example, although Kelvin is an example to the contrary. The discovery of the worth of by-products in manufacturing processes is the result, directly or indirectly, of academic research. The value of slag, the worth of certain products formerly wasted in refining oil, in making wood pulp, in making cottonseed oil, has become greater than the original value of the primary products themselves. Mr. Andrew Carnegie has said that his firm was the first to employ a scientific chemist in the manufacture of iron and steel. He thus learned the value of slag. On visiting an iron school, he saw a workman dumping slag upon the waste heap. On inquiry he found that he could buy this slag for a few cents a ton. In Pittsburgh he knew this waste was worth \$10 a ton. The freight and the original cost did not exceed \$2. He said that he was able to carry on this profitable business for a time, but presently the Cleveland manufacturer also became knowing, and then kept the profits

to himself. Such gains have resulted not only in the building up of great individual fortunes, but also in the enlargement of wealth of the whole community. The investigations carried on in college and university laboratories of the sciences and the dissemination of the knowledge of these results among the farmers of Iowa and Illinois are adding each year millions of dollars to the wealth of these and of other states.

**Choice of a College.**—One of the more serious practical questions regarding the college relates to the reasons which should control the choice of a particular college for the individual student. It is to be said, first, that colleges are so unlike that the selection should be made with discrimination. A college fitted for one may be unfit for another; one boy should go to an urban, another to a rural, one to a small, another to a large college. Among the considerations to be weighed in the choice of a place for one's education are:

First, the quality of the instruction. Is the teaching exact, comprehensive, scholarly, inspiring? or is it slovenly, loose, narrow, deadening? Akin to this element, and some would say more important, is the character of the teacher. Is he a large gentleman, noble in manhood, as well as dignified and gracious? Is he a man of the world in the proper sense? Does he take interest in the individual student? does he seek to use the truth and the forces of his teaching in building up the character of each man whom he teaches?

A third consideration in the choice of a college relates to the amount of the instruction provided and to the equipment of laboratories and libraries. Certain colleges are obliged to be content with offering only a few courses of instruction. They are not able, by reason of poverty, to provide more than the primary or introductory courses on the great subjects of knowledge. They are not at all qualified to train scholars. The amount, also, is to be valued. Are there properly furnished laboratories in chemistry, physics, biology and geology? Is that laboratory of laboratories, the library, well endowed? and is its administration effective? Such matters are tests of the worth of a college to the individual student.

The college as a teaching institution is one thing; the college as an institution of research is another; but a college whose

teachers are devoted to research should be the best instrument of teaching. A college whose teachers will not enlarge the bounds of truth is not usually the most efficient force for the formation of character. The scholar on the other side of the institution, as manifested in its power for research, is to be included in the estimate.

It is also to be said that the spirit of the college helps to declare its value. A spirit of superciliousness, of superciliousness, of human remoteness, of indifference to the cardinal virtues and graces in a college—if such an one can be found—should turn the seeking student away from its portals. A spirit of enthusiasm for life, of love for the college, of respect for the highest and the best, of loyalty to the church and its institutions, should attract the student.

In respect to the size of a college, the chief thing to be said is that the large college trains the student more through personality, especially the personality of students themselves. The attrition of living mind on living mind is a mighty force for training character. The small college trains men more through truth, although the characters of the teachers may, in certain instances, become more impressive upon the mind of the student. On this ground, therefore, to some men the large college is of higher worth, and to others the small. In this, as in every other respect, that college is to be selected which will best fit into the needs and hopes of the individual collegian.

**These Advantages Are Common to All Countries.**—It is the purpose of this article to indicate some of the more important practical results of the higher education as it is conducted in America. Similar results in kind are found in other countries. But the practical side of these results is inevitably greater in America than in other countries, although in some older countries the results of these results are considerable worth. They are probably also of more worth, especially as the results of research, in Germany than in England. But everywhere, in countries both old and new, these results are of much value in the proper training of individuals for great human service and in the discovery of truth, which must immediately or ultimately make for the betterment of men.

## DICTIONARY OF EDUCATION AND EDUCATIONAL ETHICS

**Abstract and Concrete.**—These terms have a very important application in many departments of practical education. *Abstract* has reference to general ideas, or the ideas of qualities considered apart from the things to which they belong; *concrete*, to those which are only conceived as belonging to particular objects or substances. Thus, if we speak of a man, a horse, a tree, etc., we use abstract or general ideas; for we are not thinking of any particular object of the class, but only of the assemblage of qualities or characteristics that especially belong to all the members of the class. But when we mention such names as Cicero, Washington, John Smith, etc., we have in our mind a conception of the characteristics that served to distinguish those persons from all other men. Thus, the expression *five pounds* represents a concrete idea; the word *five*, an abstract one.

The immature minds of young children employ to a great extent concrete ideas, and hence the instruction addressed especially to them should deal principally with these. As the mind advances, it becomes more and more occupied with abstract conceptions,

which constitute the material for all the higher forms of thought.

*Academy* is a commonly the name of a pleasure ground near Athens, and was said to be so called after Academus, a local hero at the time of the Trojan war. Its shady walks became a favorite resort for Plato; and as he was accustomed to lecture here to his pupils and friends, the school of philosophers which was founded by him was called the *Academic school*, or merely the *Academy*.

Among the Romans, Cicero, who regarded himself as an adherent of the Academic philosophy, gave the name of Academy to the gymnasium at his villa near Tusculum, as well as to one of his villas in Campania, where he wrote his *Academica Questiones*. During the middle ages, the term was but little used for learned institutions; but, after the revival of classical studies in the fifteenth century, it again became frequent. In a wider sense, it was sometimes applied to higher institutions of learning in general. Gradually, however, its use was, in most countries, restricted to special schools, as academies of mining, of commerce, of forestry, of fine arts,

and, especially, of music. In England and the United States, the national high schools for the education of military and naval officers are called academies. Thus, England has the Naval academy at Portsmouth, and the Royal Military academy at Woolwich; and the United States, the Military academy at West Point, and the Naval academy at Annapolis. In the United States, the name has also been assumed by a large number of secondary schools, which are designed to prepare their pupils for college, to impart a general knowledge of the common and higher branches of education.

The name *academy* is also employed to designate associations of learned men for the advancement of science and art. Some of these associations are of an entirely private character, others have been founded by the state. The first academy of this kind was the Museum of Alexandria, in Egypt, which was founded by Ptolemy Soter. After its model, the Jews, toward the close of the first century of the Christian era, began to establish academies for the development of Talmudic science. Later, the Arabian caliphs established acad-

emies at their places of residence, to show their interest in the promotion of science.

Efforts to establish Christian academies of this kind were made by Gregory the Great and Charlemagne, but both failed. In the middle of the fifteenth century, associations of this kind were formed in Italy for the purpose of fostering the free development of science and art, in opposition to the rigid conservatism of the monastic and ecclesiastical schools. They gave special attention to the cultivation of the Italian language and literature. It was especially the *Accademia della Crusca*, founded at Florence by the poet Grassini, to which the Italian language is indebted for its purification and development. From Italy, these institutions spread to the other countries of Europe; and, as they became the centers of literary activity, they exercised everywhere a prominent influence upon the intellectual progress of the several countries, and especially upon the improvement and regulation of the native tongue. Prominent among these academies was the *Académie Française*, or French Academy, instituted in 1635 by Cardinal Richelieu.

The French Academy is one of five academies, and the most eminent, constituting the Institute of France. It is composed of 40 members, elected for life, after personal application and the submission of the nomination to the head of the state. It meets twice weekly, at the Palace Mazarin, Paris, and is "the highest authority on everything appertaining to the niceties of the French language, to grammar, rhetoric, and poetry, and the publication of the French classics." A chair in the Academy is the highest ambition of most literary Frenchmen.

The other academies of the Institute of France are: The Academy of Inscriptions and Belles-Lettres, with 40 members; Academy of Sciences, with 68 members; Academy of Fine Arts, with 40 members (as follows: Painting, 14; sculpture, 8; architecture, 8; engraving, 4; musical composition, 6); and Academy of Moral and Political Science, with

40 members. All members are elected for life. Like the French Institute, the academies in the capitals of Spain, Portugal, Sweden, Russia, and other countries, have gradually become great national centers for the promotion of science and art; but no such cen-

tralization has been effected in Italy, Germany, England, or the United States. In England, the learned corporations corresponding to the continental academies of science have generally the same society or association.

### The Forty Immortals of the French Academy

YEAR ELECTED	NAME	BORN	PREDCESSOR
1	1870	Emile Olivier	Marseille, 1825
2	1874	Alfred Jean François Mézières	Paris, 1826
3	1868	Gildwin P. de Cléron Comte d'Haussonville	Paris, 1843
4	1868	Jules Arnaud Arènes Claretie	Limoges, 1840
5	1860	Charles Louis de Saulles de Freymont	Paris, 1828
6	1861	Louis Marie Julien Vaucl (Pierre Loti)	Rechofort, 1850
7	1862	Ernest Lavisse	Novion, 1847
8	1863	Paul Louis Thureau-Dangin	Paris, 1837
9	1864	Paul Bourget	Amiens, 1852
10	1864	Henri Houssaye	Paris, 1858
11	1865	Jules Lemaitre	Orleans, 1833
12	1866	Jacques Anatole Talbault (Anatole France)	Paris, 1844
13	1867	Albert Comte de Mun	Lumigny, 1841
14	1867	Gabriel Hanotaux	Beaurevoir, 1833
15	1868	Henri Léon Emile Lavedan	Orleans, 1850
16	1869	Paul Deschanel	Brussels, 1856
17	1860	Paul Hervey	Neuilly, 1857
18	1860	Auguste Emile Augier	Le Rocher, 1847
19	1901	Charles Jean Melchior, Marquis de Vogüé	Paris, 1829
20	1901	Edmond Rostand	Marseille, 1868
21	1903	Félicie Masson	Paris, 1847
22	1903	René Basin	Angers, 1833
23	1903	Etienne Lamy	Clair, 1845
24	1906	Alexandre Félix Joseph Ribot	St. Omer, 1842
25	1906	Maurice Barres	Chartres, 1862
26	1907	Marquis de Ségur	Paris, 1833
27	1907	Maurice Donnay	Paris, 1860
28	1908	Jules Henri Poincaré	Nancy, 1854
29	1908	Jean Richepin	Médan, Algeria, 1848
30	1908	Francis Chateaux	Aurillac, 1848
31	1909	René Doumic	Paris, 1879
32	1909	Jean Alcard	Toulon, 1848
33	1909	Eugene Bréhat	Haley, 1859
34	1910	Raymond Poincaré	Bar-le-Duc, 1860
35	1910	Monsieur Durban	St. Sevan, 1843
36	Vacant		
37	Vacant		
38	Vacant		
39	Vacant		
40	Vacant		

### British Learned and Scientific Societies

NAME AND ADDRESS	FOUNDED	OBJECT	NAME AND ADDRESS	FOUNDED	OBJECT	NAME AND ADDRESS	FOUNDED	OBJECT
<b>Aeronautical Society of Great Britain</b> , 53 Victoria Street, S. W., London, N. Afr. S. W., London.	1866	The study and promotion of aeronautics.	<b>Geological Society of Edinburgh</b> , 1 India Buildings, George IV. Bridge, Edinburgh.	1834	The advancement of geology.	<b>Institution of Mining Engineers</b> , 20 Victoria Street, S. W., London.	1859	The advancement and encouragement of the science of mining, metallurgy, engineering, and their allied industries, etc.
<b>Association of Economic Biologists</b> , University, Birmingham.	1904	The promotion of economic biology.	<b>Geological Society of London</b> , Burlington House, Piccadilly, W., London, F. G. R.	1807	The advancement of geology.	<b>Institution of Naval Architects</b> , 3 Adelphi Terrace, W. C., London.	1860	To promote the improvement of ships, and all that specially appertain to them.
<b>British Archaeological Association</b> , 22, Cockspur Street, W., London.	1843	Archæology.	<b>Geologists' Association</b> , University College, W. C., London.	1858	To facilitate the study of geology and its allied sciences.	<b>Iron and Steel Institute</b> , 28 Victoria Street, S. W., London.	1869	The promotion of the iron and steel trades in their practical and scientific aspects.
<b>British Association for the Advancement of Science</b> , Burlington House, W., London.	1831	The promotion of scientific inquiry and research.	<b>Institute of Chemistry of Great Britain and Ireland</b> , 30 Bloomsbury Square, W. C., London.	1877	1. To promote education of persons desirous of becoming professional consulting and analytical chemists, etc. 2. To examine candidates and grant certificates. 3. To elevate the position of chemists.	<b>Linnean Society of London</b> , Burlington House, Piccadilly, W., London, F. L. S.	1788	The study of botany and zoology.
<b>British Astronomical Association</b> , 136 Rodenbush Road, Clapham Park, S. W., London.	1890	Astronomical observation and encouragement of a popular interest in astronomy.	<b>Institution of Civil Engineers</b> , Great George Street, Westminster, S. W., London, F. I. C.	1818	The general advancement of mechanical science.	<b>Marine Biological Association of the United Kingdom</b> , The Laboratory, Citadel Hill, Plymouth, and Marine Biological Laboratory, Lowestoft.	1884	The advancement of British sea fisheries and of marine zoology.
<b>British Ornithologists' Union</b> , 3, Hanover Square, W., London, M. B. O. U.	1858	The advancement of the science of ornithology.	<b>Institution of Electrical Engineers</b> , 92 Victoria Street, Westminster, S. W., London, M. I. E. E.	1871	Telegraphy and electrical science.	<b>Medical Society of London</b> , 11 Chandos Street, W., London.	1773	Medical studies.
<b>Chemical Society of London</b> , Burlington House, W., London, F. C. S.	1841	Advancement of chemical science.	<b>Institution of Mechanical Engineers</b> , Storey's Gate, St. James' Park, S. W., London, M. I. M. E. C. E.	1847	To promote the science and practice of mechanical engineering.	<b>Mineralogical Society</b> , Care of Geological Society, Burlington House, Piccadilly, W., London.	1876	Mineralogy and crystallography.
<b>Civil and Mechanical Engineers' Society</b> , 25 Victoria Street, S. W., London.	1859	The advancement of engineering.			<b>Pharmaceutical Society of Great Britain</b> , 17, Abchurch Lane, E. C., London.	1841	The advancement of pharmacy and allied sciences.	
<b>Entomological Society of London</b> , 11 Chandos Street, W., London.	1833	The study of entomology.						
<b>Folk-Lore Society</b> , 11 Old St., Lincoln's Inn, W. C., London.	1878	The collecting and preservation of relics of folklore.						

## British Learned and Scientific Societies—Continued

NAME AND ADDRESS	FOUNDED	OBJECT	NAME AND ADDRESS	FOUNDED	OBJECT	NAME AND ADDRESS	FOUNDED	OBJECT
<b>Philosophical Society,</b> University College, Gower Street, W. C., London.	1842	Philosophical studies.	<b>Royal Geographical Society,</b> 1, Saville Row, W., London. F. R. G. S.	1830	Advancement of geographical science.	<b>Royal Microscopical Society,</b> 20, Hanover Square, W., London. F. R. M. S.	1839	The promotion of microscopical and biological science.
<b>Philosophical Society,</b> Cambridge, New Museum, Cambridge.	1819	Scientific inquiry in philosophy and natural history.	<b>Royal Historical Society,</b> 7, South Square, Gray's Inn, W. C., London. F. R. Hist. S.	1868	Historical inquiry.	<b>Royal Philosophical Society of Glasgow,</b> 207, Bath Street, Glasgow.	1802	To aid the study of the physical, natural, mental, and moral sciences.
<b>Physical Society of London,</b> Royal College of Science, South Kensington, S. W., London.	1874	The advancement of physical science.	<b>Royal Horticultural Society,</b> Vincent Square, Westminster, S. W., London. F. R. H. S.	1804	The advancement of horticulture.	<b>Royal Society of Arts,</b> John Street, Adelphi, W. C., London.	1754	The encouragement of arts, manufactures, and commerce.
<b>Psychical Research, Incorporated Society for,</b> 20, Hanover Square, W., London.	1882	Investigation of psychical phenomena, telepathy, etc.	<b>Royal Institute of British Architects,</b> 9, Conduit Street, W., London. F. R. I. B. A.	1834	The advancement of architectural science.	<b>Royal Society,</b> Burlington House, W., London.	1662	The promotion of natural knowledge.
<b>Royal Agricultural Society of England,</b> 16, Bedford Square, W. C., London.	1838	The practical and scientific advancement of agriculture.	<b>Royal Institute of Public Health,</b> 37, Russell Square, W. C., London.	1886	The advancement of preventive medicine, the study of the public health and the foundation of laboratories for chemical, bacteriological and pathological work and research.	<b>Royal Society of Edinburgh,</b> Princes Street, Edinburgh. F. R. S. E.	1783	Science and polite literature.
<b>Royal Anthropological Institute of Great Britain and Ireland,</b> 3, Hanover Square, W., London.	1871	Anthropology.	<b>Royal Institution of Great Britain,</b> 21, Albemarle Street, W., London.	1799	The promotion of scientific and literary research, and of experimental science.	<b>Society of Antiquaries of London,</b> Burlington House, W., London. F. S. A.	1572 Incor. 1751	Antiquarian study.
<b>Royal Archaeological Institute of Great Britain and Ireland,</b> 20, Hanover Square, W., London.	1835	Study of archaeology.	<b>Royal Meteorological Society,</b> 70, Victoria Street, Westminster, S. W., London. F. R. Met. Soc.	1850	The study of meteorology and climatology, and the promotion of observational work.	<b>Society of Engineers,</b> 17, Victoria Street, S. W., London.	1854	The advancement of the science and practice of engineering.
<b>Royal Asiatic Society,</b> 22, Albemarle Street, W., London. R. A. S.	1823	Oriental research.			<b>Victoria Institute,</b> 8, Adelphi Terrace, W. C., London.	1865	The study of philosophy and sciences, and their bearing upon the teachings of Holy Writ.	
<b>Royal Astronomical Society,</b> Burlington House, W., London. F. R. A. S.	1820	Advancement of astronomy.			<b>Zoological Society of London,</b> 3, Hanover Square, W.	1826	The promotion of zoology and animal physiology.	
<b>Royal Botanical Society,</b> Inner Circle, Regent's Park, N. W., London.	1839	Furtherance of plant study in its scientific and practical aspects, by means of a botanic garden, floral exhibitions, etc.						

## Canadian Societies

Canadian Institute, 68 Richmond Street, Toronto.	1849	Scientific re- search.	Entomological Society of Ontario, Guelph, Ontario. Branches of society in Montreal, Quebec, Toronto, and British Columbia.	1863	To assist and en- courage the study of en- tomology.	Royal Astronomical Society of Canada, 198 College Street, Toronto.	1890	Astronomy, etc.
Chemical Society, McGill University, Montreal.	1902	Discussion of contemporary chemical work.				Royal Society of Can- ada, Ottawa.	1882	The encourag- ment of litera- ture and sci- ences.

## American Societies

American Academy of Natural Sciences, of Philadelphia.	1812	Cultivation of natural sciences.	American Entomological Society, Philadelphia.	1859	The study of insects.	American Mathematical Society, 501 West 114th Street, New York City.	1888	To encourage and maintain an active interest in mathematical science.
American Academy of Medicine, 52 N. 4th Street, Easton, Pa.	1876	To encourage the proper educational preparation of physicians. Study of problems of "social medicine."	American Forestry Association, Washington, D. C.	1882	To encourage protection and proper use of forests.	American Microscopical Society.		To encourage microscopical research.
American Academy of Political and Social Science, University of Pennsylvania, Philadelphia, Pa.	1889	To promote scientific study and investigation of the social sciences.	American Geographical Society, 15 West 84th Street, New York City.	1852	To encourage geographical exploration, and to aid in spreading geographical knowledge.	American Oriental Society, New Haven, Conn.	1842	To promote Oriental scholarship.
American Antiquarian Society.	1812	Collecting and preserving antiquities.	American Institute of Electrical Engineers, 23 West 30th Street, New York.	1884	Advancement of electrical engineering.	American Philosophical Society, Hall No. 104 South 5th Street, Philadelphia.	1743	
American Association for the Advancement of Science, Washington, D. C.	1847		American Library Association, 34 Newbury Street, Boston, Mass.		The promotion of library interests, the interchange of experience and opinion, the advancement of the profession of librarianship in America.	American Psychological Association, 220 College, Northampton, Mass.	1892	To advance the interests of psychology as a science.
American Chemical Society.	1876	Advancement of chemistry and promotion of chemical research.			American Public Health Association.	1872	To advance public hygiene.	
					American Society of Civil Engineers, 220 West 54th Street, New York.	1852	The advancement of engineering knowledge, and the maintenance of a high professional standard.	

## American Societies—Continued

NAME AND ADDRESS	FOUNDED	OBJECT
American Society of Naturalists, Baltimore.	1853	For the exchange of ideas regarding problems of evolution and natural history.
Archaeological Institute of America, Washington, D. C.	1879	To promote and conduct archaeological investigation and research.
Association of Economic Entomologists, Iowa.	1889	To consider work and results pertaining to economic entomology.
Geological Society of America, Museum of Natural History, New York.	1888	For the promotion of geological science.
National Academy of Sciences, Washington.	1863	Two meetings a year, April and November.
National Educational Association, Wisconsin.		To elevate the character and advance the interests of education, to disseminate methods of teaching, and to promote the cause of public education in the United States.
National Geographic Society, Howard Memorial Hall, Washington, D. C.	1888	The increase and diffusion of geographic knowledge.
Naval Architects and Marine Engineers.	1893	To promote practical scientific knowledge in the art of ship-building and marine engineering, etc.
Scientific Alliance of New York, New York City.	1891	To promote the interests of the allied scientific societies which compose it.
Society for the Promotion of Agricultural Science, Urbana, Ill.	1880	To promote the sciences applied in agriculture.

In the United States of America there are also a number of learned societies to which the name *academy*, in the sense used on the continent of Europe, has been applied. **Alexandrian Library.** The largest collection of books of the ancient world, founded by Ptolemy Soter in the city of Alexandria toward the beginning of the third century B. C. At one time it is said to have contained 700,000 manuscripts, embracing the collected literature of Rome, Greece, India, and Egypt. It was partly destroyed by fire by a mob of fanatic Christians in A. D. 391, and was finally dispersed or destroyed during the siege of Alexandria by the Arabs under Amr, A. D. 638.

**Alexandrian School.** A name variously applied, but chiefly designating (1) a school of philosophers at Alexandria in Egypt which is chiefly noted for the development of neoplatonism, and its efforts to harmonize oriental theology with Greek dialects; (2) a school of Christian theologians in the same city which aimed at harmonizing pagan philosophy with Christian theology. The city of Alexandria became, soon after the death of Alexander the Great, by whom it had been founded, a chief seat of science and literature. The time during which the teachers and schools of Alexandria enjoyed a world-wide reputation is called the *Alexandrian age*, and is divided into two periods, the for-

mer embracing the time of the Ptolemies, and extending from 323 to 30 B. C., and the second embracing the time of the Romans, extending from 30 B. C. to 640 A. D. Grammar, poetry, mathematics, and the natural sciences were all taught in the Alexandrian school; and among the most illustrious teachers were Ammonius, Plotinus, Hierocles, Proclus, Apollonius (poet), Galen (physician), Euclid (mathematician), Eratosthenes (astronomer), Ptolemy (geographer). When Christianity began to gain a firm footing, it was found necessary to devote special care to instruction of the catechumens in order to fortify them against the attacks upon Christianity by the pagan philosophers. The catechists not only gave to the candidates for admission into the Christian church elementary instruction, but also delivered learned lectures on Christianity, and combined with it instruction in philosophy. Though, from its original character, the school continued to be called the catechetical school of Alexandria, it was in its subsequent development something very different from a catechetical school, and may rather be regarded as the first theological faculty, or school of scientific theology, in the Christian church in opposition to the pagan philosophers, the teachers of the Christian schools chiefly undertook to show that Christianity is the only true philosophy, and alone can lead to the true *gnosis*, or knowledge. As the first teacher of the Christian theological school Pantaenus (about 180) is mentioned, who was followed by Clement, Origen, Heracles, Dionysius, Pinesus, Theognostus, Serapion, Peter Martyr. The last famous teacher of the school was Didymus the Blind, 335 to 395.

**Alphabet.**—The alphabet of any language is the series of letters, arranged in the customary order, which form the elements of the language when written. The name is derived from the first two letters in the Greek alphabet, which are named *alpha*, *beta*. The letters in the English alphabet have the same forms as those of the Latin language, which were borrowed from the Greek. The Greek alphabet, however, did not contain all the Greek letters. The letters of the Greek alphabet were borrowed from the Phœnician, which was that used by many of the old Semitic nations, and is of unknown origin. It consisted of twenty-two signs, representing consonantal sounds. Into this alphabet the Greeks introduced many modifications and the changes made by the Romans were also considerable. Its use in English presents many variations from its final condition in the Latin language. Thus, I and J, and U and V, instead of being merely graphic variations, were changed so as to represent different sounds, during the sixteenth and seventeenth centuries. W was added previously, in the middle ages. The twenty-six letters of our alphabet have been thus classified with regard to their history: (1) B, D, H, K, L, M, N, P, Q, R, S, T, letters from the Phœnician; (2) A, E, I, O, Z, originally from the Phœnician, but changed by the Greeks; (3) U (same as V), X, invented by the Greeks; (4) C, F, Phœnician letters with changed value; (5) G, of Latin invention; (6) Y, introduced into Latin from the Greek, with changed form; (7) J, Y, graphic Latin form; (8) independent letters; (9) W, a recent addition, formed by doubling U (or V), whence its name.

The imperfections of the English alphabet are manifold: (1) Different consonants are used to represent the same sound; as c (soft) and s (soft) and j, c (hard) and k, q and x. (2) The same letter has different sounds; as g, the same letter, as *g* in *cut* and *cell*, in *get* and *gin*, *s* in *sit* and *as*, *f* in *if* and *of*, etc. (3) The vowels are constantly interchanged, as is illustrated in the subjoined table of the vowel elements of the language and their literal representations.

From this table it will be seen that the letter *a* is used to represent seven different sounds; *a*, five sounds; *o*, six sounds, etc. The names given to the letters are not in conformity with a uniform principle. The letters are, thus, the names of b, c, d, g, p, t, v, and z are *be*, *ce*, *de*, *pe*, etc.; while the names of *f*, *l*, *m*, *n*,

*s*, and *x* are *ef*, *el*, *em*, *en*, etc.; and the names of *j*, *k*, and *z* are, *ka*.

The heterogeneity of these names and of their construction will be obvious. It is important, that the teacher should take cognizance of these incongruities in giving elementary instruction, as they dictate special methods of presentation.

Short.	Long.
<i>a</i> as in <i>and</i>	<i>e</i> as in <i>ape</i> , <i>ere</i>
<i>a</i> as in <i>hat</i>	<i>e</i> as in <i>care</i> , <i>they</i>
<i>a</i> as in <i>what</i> , not	<i>o</i> as in <i>now</i> , <i>go</i>
<i>i</i> as in <i>it</i>	<i>o</i> as in <i>all</i> , <i>orb</i>
<i>o</i> as in <i>law</i> , put,	<i>i</i> as in <i>ever</i> , <i>plague</i>
<i>u</i> as in <i>look</i> , put,	<i>u</i> as in <i>her</i> , <i>us</i> , <i>myrrh</i>
<i>book</i>	<i>a</i> as in <i>old</i>
<i>e</i> as in <i>love</i> , <i>luck</i>	<i>u</i> as in <i>do</i> , <i>rule</i> , <i>too</i>
<i>ay</i> as in <i>oil</i> , <i>boy</i>	<i>u</i> as in <i>sun</i>
<i>ow</i> as in <i>out</i> , <i>owl</i>	<i>u</i> as in <i>use</i> , <i>my</i>

**Analytic Method of Teaching.**—This is the method used by the teacher when he presents to his pupils composite truths or facts, and by means of analysis shows the principles involved, or the mind of the pupil to an analysis of them for himself. In this way he teaches principles which the pupil is to apply to the elucidation of many diverse problems. In the synthetic method, the teacher begins with isolated principles, explains their meaning, and shows how they are to be applied.

Thus, suppose the pupil is to be taught how to add and subtract fractions. According to the analytic method, the fractions to be operated upon are presented to the pupil's mind, and he is shown, first, the difficulty involved, and secondly, how to surmount this difficulty, by (1) finding a common denominator, and (2) by changing the numerators so that the fractions with the common denominator may have the same value as the given fractions. Then the method of addition or subtraction becomes obvious. In this way, learning the principles by analysis, the pupil is enabled to construct a general rule, and apply it to any given case. In the synthetic method, the pupil would be taught, in the first place, the nature and use of a common denominator, then the method of reducing fractions to a common denominator, and then to add or subtract fractions by finding a common denominator. If the object of the instruction is to give the pupil the means to make the pupil expert in adding and subtracting fractions, the analytic method would perhaps have some advantage over the analytic; but, since an important part of this object is to train the mind, the analytic method is greatly to be preferred; for (1) it stimulates the mind to greater activity, (2) it teaches it how to investigate for itself, and to discover truth, and (3) it gives it a much clearer knowledge of the fundamental principles involved in the subject taught.

Whether the analytic method should be employed, and to what extent, is to be determined by a consideration of the subject, the subject taught, and the degree of advancement of the student. In the higher stages of education, much time would be lost by rigorously following this method; and if, in the more elementary stages, the pupil's mind has been thoroughly trained in this way, it will not be necessary to adhere to it when he comes to study the higher branches. At every stage, and in every branch of instruction, however, there will be occasion for the use of both analysis and synthesis; and the skill and judgment of the teacher must be exercised at every step, to determine which is the appropriate method to be employed.

**Arts, Liberal.**—The term *arts*, or *liberal arts*, was, during the middle ages, applied to certain studies which constituted an essential part of a learned education. The full course of study, at that period, embraced "the seven liberal arts," three of which—grammar, logic and rhetoric—composed what was called the *trivium* (the triple way to eloquence); and the remaining four—music, arithmetic, geometry, and astronomy—constituted the *quadrivium* (the fourfold way). The term *liberal arts* is denoted in the universities, those who devoted themselves to philosophy and science

in contradistinction to the faculty of theology, of medicine, or of law. *Master* (*Lat. magister*) was used to designate one who taught the liberal arts; and *doctor*, one who taught or practiced divinity, law or medicine. The first degree (graduate) in the liberal arts, instituted, as it is said, by Gregory IX. about the middle of the thirteenth century, was that of *bachelor* (*Lat. baccalaureus*); and the second title of *master*, which originally conferred the right, and indeed imposed the duty, of teaching one or more of the liberal arts. This title, in many colleges and universities of the United States, England, and France, is now merely honorary.

**Attention** (from the *Latin tendere*, to strain, implying a strained effort of the mind) is perhaps the most important of the mind's activities, since the quality and duration of the intellectual impressions depend upon the degree of attention with which the faculties have been exerted in acquiring them. There is no point of difference between the trained and the untrained intellect so striking as the voluntary power of fixing the mind for a continuous period of time upon any given subject. Hence, to discipline this power becomes, in an especial manner, the office and duty of the educator.

Commencing with the most rudimentary exercise of the observing faculties, he passes on, step by step, to the process by which, through the entire and determined giving up, as it were, of the whole mind to the contemplation and study of any given class of facts or ideas, the student learns to evolve new truths, or analytically to explain the intricacies of obscure problems. When the attention has become obedient to the will, this branch of mental training is complete; and, therefore, the aim of the educator should be to instill habits of controlling the attention, and rapidly preventing those of desultory, wayward application, or listlessness.

This power of continuous attention is, without doubt, the most valuable result of intellectual training. To produce this result is one of the first important duties of the pupils, especially in the earlier stages of instruction. Young minds have an intense desire to know—not words merely, but things. They have a strong craving for facts, and make the deepest enjoyment in the exercise of the perceptive and conceptive faculties. Hence the importance of object-teaching. The perceptive faculties are exercised in the observation of the sensible qualities of all the different things with which the child is surrounded, or which may be presented to its view by the teacher, for the purpose of attracting its attention; and these objects should be diversified as much as possible, so as to appeal to the child's love of novelty.

The attention should not be exercised for long periods of time. When the teacher perceives that it is flagging, it is best to stop the exercise; for all that is done while the child's attention is relaxed is worse than fruitless. It is from inattention to this truth that children are often made incurably listless in school. They are set at work, and their minds, which are awakened no interest in their minds, and, consequently, acquire ineradicable habits of superficial, careless attention. In all the subsequent studies of the pupil it is his duty to keep his interest as awake as much as possible; but it will be found there is a reciprocal action of interest and attention. The pupil having acquired in the first stages, in some degree, the habit of voluntary attention, will, as a matter of duty, apply his mind to the studies prescribed for him; and this very application, if earnest and diligent, will soon excite the dearest interest in the subject of study.

The dependence of memory upon attention is well known to all who have observed, however superficially, the operations of the mind; and the power to recall at will our mental impressions and acquisitions is perhaps directly in proportion to the attention with which the associations binding them together were formed. When these are feeble, loose, accidental, and formed with little volition, the mind will have but an imperfect control of its thoughts, and will thus be wanting in the chief quality of a sound intellectual character.

Attention requires a vigorous exercise of the brain, and, therefore, is more or less dependent upon the physical condition. When this has been exhausted by labor, either bodily or mental, or weakened by disease, attention is feeble and unstable; and the more it is injurious, because it induces still further nervous prostration. Neither should deep attention be exerted or attempted immediately after a hearty meal. The nervous energy thus directed to the digestive functions, which active cerebration will greatly disturb. Hence the diet of a student should be light but nutritious. The brain should also be supplied with thoroughly oxygenated blood. No one can think well in an impure atmosphere, especially if it is contaminated by the breathing of many persons. In this way children often suffer a serious loss of health. They are crowded in apartments too small for the number to be accommodated, and very imperfectly ventilated; and, at the same time, are expected to give close and earnest attention to the subjects of instruction. This is a physical impossibility, and the attempt to do it must always be followed by disastrous results. In no respect has the aphorism, "a weak body is a weak mind," more ready application than to the exercise of attention. For what contrast can be stronger than that presented by the poor wretch whom disease has bereft of every mental state but wandering thoughts or absolute vacuity, and the man of sound health and a well trained mind, who is ready at will to concentrate all his intellectual energies upon a given subject, and to keep them steadily fixed upon it until the object of his investigations has been attained?

**Authority** is the right to command, or the persons or body by whom the right is exercised; sometimes, also, in matters pertaining to the intellect, the power to influence or exact belief. In education, the term has especially this twofold application: (1) to the discipline or management of children; (2) to the instruction of the primary authorities of the child. In the first respect, to which the child is subjected is that of the parent; and for several years no other can be exercised, since the child is not yet of legal age. It is true, the state extends a protecting care over the child; but only by an exercise of its authority over the parents, requiring them to perform their proper duties as the natural guardians of their children. When the parents neglect or repudiate these duties, or are guilty of acts in contravention of them, the state interposes its authority, but not even then directly, upon the child, but only to place it under the authority of those who will better care for its interests, and perform for it the natural duties of its parents. The right exercise of parental authority is, therefore, one of the most important elements in the education of the child.

If the child from its earliest years has been accustomed to recognise and submit to the authority of its parents, firmly but judiciously exercised, no further order will be necessary, on the part of the teacher, in making his authority effective. The child, on entering the school, feels for the first time that it is under an authority different from that of its parents, and to which it has previously been accustomed to submit with unquestioning obedience. Its first impulse is, perhaps, to refuse submission to this new authority; and the influence of the teacher over the child will greatly depend upon the manner in which obedience is enforced. In the authority of the teacher, as well as in that of the parents, two elements are combined—one that attracts and encourages, and one that curbs and subdues. Without the former, authority is arbitrary and violent; without the latter, it is feeble and often powerless.

It is a matter of the utmost importance that all persons concerned in the education of the child should coöperate harmoniously; since nothing tends so much to weaken the force of authority in the mind of the child as to notice a conflict among those to whom control is placed. Father and mother, parent and teacher, teacher and school board, should, at any rate as far as the child is concerned, be absolutely harmonious. The children know of any difference of opinion between their custodians, the more cheerfully

will they respect and submit to the principle of authority in general.

**Bachelor** (*Lat. Baccalaureus*), a term applied to one who has reached a certain grade in a college or university education; as, *Bachelor of Arts* (*A. B.*), *Bachelor of Science* (*B. S.*), *Bachelor of Divinity* (*B. D.*), etc. The word as thus used is of uncertain etymology. It was introduced into the University of Paris by Pope Gregory IX. in the thirteenth century, and was applied as a title to those students who had passed certain preliminary examinations, but were not prepared for admission into the rank of master, teacher, or doctor. Afterward, it was adopted by other European universities, to indicate the lowest academic honor, as it is now used both in this country and in Europe.

**Belles-Lettres** is a French expression for *polite literature*, i. e., books and language in so far as they are shaped by the idea of beauty. It has been used in English to designate a somewhat vague class of studies connected, more or less loosely, with the mastery of literature on its æsthetic side. Some of the colleges in the United States have a professor of *belles-lettres*. He teaches rhetoric and elocution, and the history of literature, and, in addition, criticism, classical philology, the humanities in general, are all in his province.

**Æsthetics** (the science of beauty) and philology have, of late years, made great advance, and new text-books are needed to set forth modern methods of studying literature and language, so as to understand their beauties. The elements of the study should be taught early. In the kindergarten or other infant school, the children should be taught to admire and examine beautiful objects, to notice the qualities which give them beauty, to name the objects and the qualities; they should be told anecdotes in which beautiful persons do beautiful acts, and the words expressive of beauty should be spoken with tones and gestures which may give them lively associations. In the primary school, memory; passages of verse or rhythmical prose in which beautiful thoughts are fittingly expressed, and of which the teacher is fond, should be recited, and the children should be pupils. Such passages may be among the noblest of our literature. It is not necessary that they should be wholly comprehended by the learners. They may be regarded as exercises in learning, and as means of vague intellectual processes, but quickening powerfully the emotional element of æsthetic culture. Language and literature should lead the youth of cultured races to a more rapid development than the natural growth of the understanding. Beautiful and noble words thus learned by heart will serve as models in which the expanding intellect may flow and form. This early oral instruction may be happily aided by learning to read in illustrated books, in which beautiful pictures are made to interpret and enforce the thought.

**Benedictines**, *Schools of the*.—The monastic order founded by St. Benedict of Nursia, at the beginning of the sixth century, occupies a prominent place in the early history of education in Western Europe. The monastic and communal schools could not thrive, at a time when the people at large felt no desire for education, when the number of teachers was so small, and when the few schools that were established, in connection with the parish churches, had to suffer so much from constant wars. The education offered by the Benedictine order was, at first, intended only for boys who were to enter upon a monastic life.

According to the fundamental rule of the order, the separation of the monk from the world should begin as early as possible. Boys called *novices* were admitted when only five years of age. The discipline was strict. The rod was used to punish offences against punctuality and order, and deficiencies in recitation and memory. The most common crimes punished by the scourge, Latin was a prominent part of the instruction, and almost exclusively the language of conversation. Reading, writing, and the singing of psalms were the principal studies, which were supplemented, but the course also included rhetoric, dialectics, arithmetic, astronomy, geography, natu-



ral science, and medicine. Special attention was given to history, as is proved by the numerous annals and chronicles issued from the Benedictine convents.

As few schools outside of the Benedictine convents could be found which offered equal opportunities for the education of children, the monks were more apt to admit boys than boys not devoted to monastic life. These applications came especially from noble and wealthy families, and were so numerous that it was soon found necessary to provide special rooms for the instruction of these boys (*scholas interiores et exteriores*).

The instruction in the elementary branches was imparted by a teacher called *colloquator*; in the larger schools and for higher studies, learned monks, called *magistri*, were appointed, under whose direction other monks, called *revisores*, acted as assistant teachers. With the decay of the Benedictine order these schools declined. Convent education, after the twelfth century, did not retain the ascendancy which it had formerly enjoyed, and where it was possible, passed over to a large extent into the hands of other monastic orders.

**Bible History, or Biblical History.**—The connected history of the events narrated in the Bible is, in many schools, both Protestant and Catholic, a part of the regular religious instruction. The method of teaching it greatly varies according to the age of the pupils. While children of the primary grade are taught only the most salient events of sacred history, in language adapted to their age, more advanced students are introduced into a more full understanding of the Bible. In the compilation of text-books for this study, the authors have sometimes endeavored to give the whole narrative as much as possible in the words of the Bible, so as to make the book, in fact, an abridgment of the Bible. Others have deemed it more profitable to attempt to retain the words of the Bible, and to look, in the first place, to making the subjects as interesting, attractive, and intelligible to children as possible.

Germany, where the Bible history is generally adopted as a part of the course of instruction in public schools of various grades, has a very extensive literature on the subject, including many manuals and text-books. Of scientific theology, Bible history forms an essential part, and is divided, like the Bible itself, into two sections, the history of the Old, and the history of the New Testament. It forms the connecting link between exegetical and historical theology, explaining, on the one hand, the contents of the Bible, and, on the other hand, treating and elucidating them the same as any other historical subject.

**Brain.** the principal organ of the nervous system, and the fountain of nervous energy to the whole body. It is the seat of consciousness, feeling, and intellect, and also the recipient of all impressions made on any part of the nervous system. The brain being the organ especially concerned in education, its hygiene is an important subject for the attention of the teacher.

The development of this organ is very rapid. The average weight of the brain in adults is about forty-eight ounces, and this limit is generally attained at the age of thirteen years. No organ is from the time of birth, so regularly and so incessantly exercised as the brain. During the period of infancy, nature herself superintends this process; and unless her care is interfered with through the ignorance, folly, or neglect of the mother or nurse, it results in a healthy growth and development. When the age of infancy is passed, and the child is surrendered to the educator, intelligence and skill may accomplish much benefit in regulating the cerebral development; or a want of skill and intelligence may do, and often does, very great injury.

Exercise is the natural instrument by which all the bodily organs are brought to a maturity of growth and strength, and by which they are kept in condition of health. In applying this principle to the school, we see that to the exercise be proper (1) as to its kind, (2) as to its degree, (3) as to its direc-

tion; and, in all these respects, that it is adapted to the age and peculiar physical condition of the child, and to the nature of the process which will answer for all. The teacher who wishes to do good, whose aim is really to educate, will study the external indications of temperament, of bodily health, and also of the cerebral structure and will, as far as possible, regulate his operations accordingly. The brain is exercised both by thought and feeling; being the seat of various faculties, both mental and moral, its action is aroused by whatever is addressed to the intellect, the conscience, the emotions, or the propensities. "The first step" toward establishing the regular exercise of the brain is to educate and train the mental faculties in youth; and the second is to place the individual habitually in circumstances demanding the discharge of useful and important duties. The healthy development of the brain may be prevented (1) by wrong exercise, (2) by being overtasked, (3) by bad physical conditions. Overtraining, or too long continued attention; excessive tasks from books, committed to memory under the pressure of fear; long confinement in close rooms, and hence the want of properly oxygenated air, will impair the functions of the brain, and in the long run result not only in future diseases but perhaps of future imbecility. So, too, when subjected to harsh discipline, to unkind treatment, to a moral atmosphere vitiated by the irritability, ill-humor, and moroseness of the parent or teacher, the brain of the child loses even its natural or normal physical condition; and its growth is necessarily morbid.

**Business Colleges.** as now existing in the United States, are the product of individual effort directed to the supplying of a public want. As distinct institutions, they are the outgrowth of the past half century, although schools and private classes for instruction in the commercial branches—particularly bookkeeping and penmanship—have been in vogue for a much longer time. Starting with bookkeeping, penmanship, and arithmetic, the study is now material, algebra, and intensified, and other not less important branches have been added, the purpose and effect of this being to give form and symmetry to the mind, and to meet the increasing demand for broadly educated accountants and clerks. Among the branches which have been added are political economy, including civil government; commercial law; foreign commerce, embracing the elements of English composition and practical grammar; stenography, typewriting, and modern languages, particularly German, French, and Spanish. Some institutions have also made a prominent feature of telegraphy.

But the feature which attracts most attention, both from its novelty and its usefulness, pertains to the practical methods of applying instruction under the guise of real business operations. This plan embraces the organizing of the advanced students into business companies, so adjusted in their workings as to represent the varied interests of business, which exist in the outside world. Thus, certain members are established as merchants, others as agents or brokers, others as manufacturers and exporters, and others as bankers, etc.; each in his turn serving in these several relations, and all together performing the functions of a well-managed business.

Not only is this method carried on in the separate schools, but some of the most prominent among them in the larger cities have established a system of intercommunication by which the work is wisely extended through postal correspondence. Thus representative merchandise is really shipped by the members of one school to those of another, drafts are drawn, remittances made, extensions and business settlements effected, and, in fact, all the minute details of a varied business are carried on. As will be seen, this extended correspondence and cooperation give the best opportunity for the exercise of criticism and discussion, and may be made as completely the rehearsal of the future business man for his life work as is the clinical practice of the medical college or the moot case of the law school.

The American business schools, until recently, have had no public recognition, except

as the result of individual work—with no official supervision to inspire or control their action; and as far as regards their methods and their degrees of excellence as are other purely business enterprises. There is little doubt that they will continue to meet the increasing demand for graduates in their number; they shall become as much a part of our educational system as are the classical and professional schools and colleges, whose purposes and scope are more definitely fixed in the public mind.

**Calisthenics**, a system of physical exercises designed to promote strength and gracefulness of movement; or, by assisting the natural and harmonious development of the muscular system, to improve the health, and add to the beauty of personal appearance. Calisthenic and gymnastic exercises are based on the same principle—that exercise is essential to the proper development of the physical as well as mental faculties, and to the maintenance of their healthy condition; and that, in education, it is requisite that suitable exercises should be systematically employed. The aim of calisthenics and gymnastics consists in the adaptation of the former to the physical education of girls; and, of course, the exercises employed require a less violent muscular action.

The exercises to be practiced with or without apparatus. The latter, which should be employed first, consist in such movements as bring into regular and systematic operation all parts of the body. The movements are neither violent nor complicated, being in fact only such as are required in the ordinary exercise of the limbs. Their advantage over those required in the common active sports of games consists in their systematic regulation so as to insure an equal and regular action of the muscles; while long continued sports of any particular kind, such as tramping, running, and using the skipping-rope, etc., have the reverse effect.

Calisthenic exercises should, however, be so varied as to exhilarate the spirit as well as to relax the muscles; they will lose much of their beneficial effect, unless the body is exercised, the mind must be interested. The simplest apparatus used consists of wands or poles, dumb-bells, back-bands, and horizontal bars, of various weights, etc. With such instruments, a great variety of beneficial, graceful, and interesting exercises can be performed; and when whole classes are exercised, the most favorable results will necessarily be a healthful mental excitement mingled with the physical training, particularly when the movements are regulated by the rhythm of music, which is usually the case in modern schools. The utility of such exercises, when properly and judiciously employed, cannot be doubted, especially after the age of 12 or 14 years, before which they should rarely, if ever, be resorted to.

**Carnegie Institution of Washington.**—A body founded by Andrew Carnegie in 1902 with a gift of \$100,000,000, to which he added \$2,000,000 in 1907, organized under the laws of the District of Columbia, and newly incorporated by Congress in 1904. Its purpose is to "conduct and support many forms of investigation, research, and discovery, and to show the application of knowledge to the improvement of mankind." It is managed by a board of twenty-four trustees who meet annually, its affairs being conducted by an executive committee who act through the president of the institution. The objects of the institution are carried out through grants of money in large and small amounts to persons engaged in special investigations. The president prepares plans and suggestions for the work of the institution and recommends all grants to the board of trustees. The board is required to report the results of their work annually, and these detailed reports, with a general report by the president, are published in the yearbook of the institution. The work falls under four heads: 1. Large projects requiring continuous research during a series of years. 2. Small projects to the number of about 300 now in progress. 3. Tentative investigation carried on by young men and women desiring to pursue special problems for one or two years. 4. Publi-

cation of meritorious works in various fields which would not otherwise be readily printed, and of reports. Of these about forty volumes have been issued.

**Chautauque Institution.**—A system of popular education inaugurated in 1874 by Lewis Miller and Rev. John H. Vincent as the Sunday-School Assembly. The place chosen was on the shores of Chautauque lake in western New York. The first meeting, lasting two weeks, was well attended, and comprised courses of biblical study, a normal department, lectures, and recreation. A novel feature was a relief map of Palestine, 300 feet in length, laid out by the lake. In the following years the development was rapid, sessions were lengthened to two months and courses of study were provided in a large variety of subjects.

As now organized, the institution has schools of English, modern languages, classics, mathematics and science, social sciences, pedagogy, religious teaching, library training, music, fine arts, expression, physical education, domestic science, practical arts, and arts and crafts. Over 200 instructors and lecturers are occupied in the work, which yearly attracts a large body of teachers and adult students. The buildings include residence cottages, gymnasium, and concert and lecture halls of large capacity. The cost of the courses is low and the various forms of entertainment are free to all in attendance, who pay a fee on entering the community.

The class work of the summer sessions is supplemented by the Chautauque Literary and Scientific Circle, a system which consists of the enrollment of readers for four years' course of home study controlled by a committee of the institution. The course includes reading in specified fields in which books, in part prepared for this special purpose, are recommended, and the preparation of written analyses of the work done. Guidance is afforded in the monthly Chautauques. The membership for 1885 was 15,000. Since organization in 1878 about 300,000 persons have pursued the courses in whole or in part. Nearly 200 assemblies, modeled on Chautauques, exist in various parts of the United States.

**Coeeducation of the sexes** denotes the system of educating males and females together, that is, in the same institution, school, or class, pupils of each sex receiving, by means of the same studies and methods, the same school training and culture. This system, in the lower grades of schools, has been almost prevalent in the United States as being the most convenient and economical for small communities.

The alleged benefits arising from it are chiefly the following: (1) Improvement in discipline, the self-will, violence, and rudeness of the boys being restrained by the presence of the girls while the girls' manners are rendered more easy and self-possessed by daily school association with the other sex; (2) improvement in instruction and study, the diversities of the sexes preventing extreme methods, and exclusive, one-sided training and study. Thus, it is said, that the tastes of the boys for severer studies, such as mathematics, are corrected by the inclination

of the girls for the lighter and more sentimental studies, general literature, poetry, etc.; (3) a more sound and healthy development of both sexes; in support of which it is asserted that schools kept exclusively for girls or boys require a much more strict surveillance on the part of the teachers. The girls, confined by themselves, develop the sexual instinct more early, their imagination being the reigning faculty, and not being bridled by intercourse with society in its normal form. So it is with the boys, on the other hand. Socially, isolation in the classroom prevents this tension, and supplies its place by indifference. Each sex, testing its strength with the other, on an intellectual plane, in the presence of the teacher—each one seeing the weakness and strength of the other, learns to esteem what is essential at its true value.

Those who oppose coeducation allege as reasons for their views: (1) That there is need of a better adaptation of instruction and discipline to the peculiarities of the sexes than is possible in mixed schools; (2) that the manners of the girls are unfavorably affected by the constant example of the rougher, coarser conduct of the boys, the latter receiving but little or no benefit from the presence of the girls; and (3) that the moral character of each is liable to be impaired by a premature development of the senses, caused by the contact and constant presence of the other sex. With but few exceptions, these arguments are advanced by those who have only theoretically considered the subject, or by those whose practical experience has been in connection with mixed schools of which the discipline and management were imperfect, thus leading to abuses which, under proper and normal circumstances, would have been eliminated. On the other hand, where there has been a thorough and proper trial of the coeducation of boys and girls, the testimony seems to be strongly, and almost exclusively, favorable to the system.

In Europe, coeducation is generally discouraged; still, the principle seems to be gaining strength, in consequence of the results of the provisions made for the higher education of women.

**College** (Latin *collegium*, originally meaning any kind of association or a name given to large classes of educational institutions, especially in the United States, England, and France. The academic use of the word *college* began about the beginning of the thirteenth century, and originated in the following manner. The students who flocked to the university towns often came into collision with the citizens, and frequent brawls resulted. In order to protect the public peace, as well as to watch over the students, lodging-houses were provided in which the students were under the charge of a superior. These houses were called *colleges*; and this name was afterward applied to any academic institution of a certain grade, whether connected with a university or not. Colleges appear to have first been established in Paris; and soon afterward in Oxford and Cambridge in Bologna and Padua, and in Prague and Vienna. They were richly endowed by popes and other dignitaries of the church,

princes, and powerful families; and, in some of the university towns just named, they became so numerous in the fifteenth century that almost every student of the university, was a member of some one of the colleges.

The American colleges grant degrees in the arts, and give the ordinary course of undergraduate instruction. Many of the older colleges give instruction in theology, law, and medicine, and thus approach to the rank of universities in the European sense of the word. Most of the so-called universities, however, furnish only collegiate instruction; and there is, as yet, no well recognized distinction between the terms *college* and *university* in the United States. About 1900, however, an effort was made toward the standardization of American colleges and universities, which has resulted in placing the following institutions in the ranking group: California, Catholic of America, Chicago, Clark, Columbia, Cornell, Harvard, Illinois, Indiana, Iowa, Johns Hopkins, Kansas, Leland Stanford Jr., Michigan, Minnesota, Missouri, Nebraska, Pennsylvania, Princeton, Virginia, Wisconsin, and Yale.

Institutions of this kind, even, considerably differ in their mode of organization. On the one hand, are those which, adhering to the old system, require no formal admission and a curriculum strictly prescribed; on the other, those which have practically no prescribed curriculum, their course of studies being arranged in schools, among which the student may select at will. Of the former Princeton may be taken as a representative; of the latter, the University of Virginia. Between these two extremes, are those that allow a greater or less freedom of choice to the student. Some, like Harvard and Yale, have distinct scientific departments; others, like Cornell University, have parallel courses, in which greater attention may be paid to science or to modern languages than to the classical course.

Of about 600 institutions in the United States, styled colleges or universities, and possessing the right to confer degrees, a majority have preparatory, and some, inferior departments, which often comprise the greater part of the students. Most of the leading universities have postgraduate courses of study.

The principal degrees conferred are as follows: undergraduate—Bachelor of Arts, of Science, of Philosophy, of Literature, of Letters. The term of study for this degree is, in almost every institution, four years; the method of instruction is ordinarily a combination of lectures, recitations, and written examinations.

The postgraduate degrees are Master of Arts, Doctor of Philosophy, Doctor of Letters, Doctor of Science; professional, Civil Engineer, Mining Engineer, Electrical Engineer, Bachelor of Laws, Master of Laws, Doctor of Laws, Doctor of Civil Law, Bachelor of Divinity, Doctor of Medicine; honorary, Doctor of Divinity, Doctor of Laws. The degree of Master of Arts is frequently conferred as of course upon Bachelors of Arts of three years standing; but, in some institutions, it implies a course of postgraduate study, and it is often honorary.

## COLLEGES AND UNIVERSITIES OF THE UNITED STATES

FOUNDED	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DENOMINATION- CONTROL	COLORS	COST OF TUITION	VALUE OF PROPERTY (including Endow- ment)	NUMBER OF INSTRUCTORS	NUMBER OF STUDENTS	VOLUMES IN LIBRARY
1896	Adelphi College	Brooklyn, N. Y.	C. H. Livermore, Ph. D.	Non-sect.	Brown and Gold	\$180	\$750,000	30	500	12,000
1889	Adrian College	Adrian, Mich.	W. W. Anthony, D. D.	Meth-Pro.		15	212	26	212	7,800
1861	Athens College	Ann Arbor, Mich.	Charles A. L. D.	Meth-Pro.		15	448	21	448	21,000
1861	Albright College	Myerstown, Penn.	Clas. A. Bowman, Ph. D.	Ev. Prot.		60	500,000	19	200	1,500
1818	Alfred University	Alfred, N. Y.	Boothe C. Davis, Ph. D.	Non-sect.	Royal Purple and Old Gold	50	850,000	28	320	22,870
1855	Allegheny College	Meadville, Penn.	Rev. W. H. Crawford, LL. D.	Methodist		60	1,000,000	19	329	25,000
1880	Allen College	Columbia, S. C.	Rev. Wm. D. Johnson, D. D.	African Meth.		60	100,000	15	316	900
1866	Alma College	Alma, Mich.	Rev. C. B. D. Cochrane, D. D.	Meth-Pro.		15	222	22	222	22,000
1885	American Int'l College	Springfield, Mass.	Rev. R. D. W. Mallory, D. D.	Non-sect.		153	125,000	12	93	3,000
1821	Amherst College	Amherst, Mass.	George Harris, LL. D.	Non-sect.	Purple and White	140	3,000,000	42	531	90,000
1850	Antioch College	Yellow Springs, O.	R. D. Fess, LL. D.	Non-sect.		40-50	800,000	18	133	9,500

## Colleges and Universities of the United States—Continued

FOREWORD	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DEPARTMENT OF CONTROL	COLORS	COST OF TUITION	VALUE OF PROPERTY (including Endowment)	NUMBER OF INSTRUCTORS	NUMBER OF STUDENTS	VOLUME IN LIBRARY	
1892	Ark. Cumberland Col.	Clarksville, Ark.	Rev. G. D. Crawford.....	Cumb. Fresh.	.....	.....	\$100,000	9	221	4,000	
1907	Atlanta Baptist College	Atlanta, Ga.	John Hope, M. A.....	Baptist.....	.....	.....	138,000	16	2346	4,900	
1860	Atlanta University	Atlanta, Ga.	Edward T. Ware, M. A.....	Non-sect.....	Steel Gray and Crimson.....	\$16	354,000	23	390	13,000	
1890	Augsburg Seminary	Minneapolis, Minn.	Sven Ottedal, D. D.....	Lutheran.....	.....	36	80,000	10	160	8,000	
1900	Augustana C. & T. S.	Rock Island, Ill.	G. A. Andrew, Ph. D.....	Lutheran.....	.....	36	383,000	40	503	24,000	
1869	Austin College	Borman, Tex.	Rev. T. S. Clyn, D. D.....	Presbyterian.....	.....	.....	350,000	17	174	10,000	
1890	Bacon College	Bacon, O.	E. N. Collette, M. A.....	.....	.....	.....	100,000	11	120	6,000	
1858	Baker University	Baldwin, Kan.	Wilbur N. Mason, D. D.....	Methodist.....	Burnt Orange and Old Gold.....	46	503,000	32	724	29,400	
1846	Baldwin University	Berea, O.	G. A. Reeder, D. D.....	Methodist.....	.....	.....	36	375,000	18	370	12,000
1863	Bates College	Lewiston, Me.	Rev. G. C. Chase, D. D.....	Non-sect.....	Garment.....	50	1,210,000	21	461	35,000	
1853	Baylor University	Waco, Tex.	W. W. Foster, Jr., D. D.....	Methodist.....	Green and Gold.....	50-60	870,000	37	1,296	22,000	
1868	Beaver College	Beaver, Penn.	.....	.....	.....	.....	150,000	15	214	3,000	
1880	Bellevue College	Bellevue, Neb.	Stephen W. Stockey, LL. D.	Presbyterian.....	.....	50	150,000	17	134	5,700	
1846	Beloit College	Beloit, Wis.	Edward D. Eaton, LL. D.	Non-sect.....	.....	50	1,821,000	38	436	42,500	
1855	Berea College	Berea, Ky.	William G. Frost, D. D.....	Non-sect.....	Blue and White.....	.....	None	1,088,000	65	1,221	25,500
1840	Bethany College	Bethany, W. Va.	T. E. Cramblet, LL. D.....	Christian.....	.....	36-120	239,000	40	898	5,500	
1881	Bethany College	Lindsborg, Kan.	Ernest F. Philbird, M. A.	Lutheran.....	.....	.....	150,000	8	108	7,000	
1854	Bethel College	Russellville, Ky.	Flora D. Perkins, D. D.	Baptist.....	.....	.....	150,000	8	100	7,000	
1897	Biddle University	Charlotte, S. C.	D. J. Sanders, D. D.....	Presbyterian.....	.....	50	190,000	11	204	4,000	
1859	Blackburn College	Carlinville, Ill.	Walter H. Bradly, Ph. D.	Presbyterian.....	.....	.....	2,959,000	154	1,566	25,000	
1863	Boston College	Boston, Mass.	Rev. W. Gascon, S. J.....	R. Catholic.....	.....	130	2,959,000	154	1,566	25,000	
1869	Boston University	Boston, Mass.	Lemuel H. Mullin, D. D.	Methodist.....	White.....	75	2,973,000	63	423	98,000	
1794	Bowdoin College	Brunswick, Me.	Rev. W. D. Hyde, LL. D.	Non-sect.....	White.....	50	90,000	14	215	6,000	
1857	Bowdoin College	Bowdoin, Ga.	Vachel D. Whitley, M. A.	Ger. Baptist.....	.....	11	250,000	40	898	5,500	
1880	Bridgewater College	Bridgewater, Va.	John S. Flory, Ph. D.	.....	.....	.....	5,000,000	90	993	164,000	
1867	Brigham Young College	Provo, Utah	James H. Linford, B. Sc.	L. Day Saints	Crimson and Gold.....	132	585,000	22	295	9,000	
1764	Brown University	Providence, R. I.	Rev. W. H. P. Faxon, D. D.	Non-sect.....	Brown and White.....	50	1,350,000	49	771	30,000	
1870	Buchtel College	Akron, O.	A. B. Church, LL. D.....	Universalist.....	.....	48	670,000	12	88	7,000	
1846	Bucknell University	Lewistown, Penn.	J. H. Harris, LL. D.....	Baptist.....	Orange and Blue.....	50	1,350,000	49	771	30,000	
1891	Buena Vista College	Storm Lake, Ia.	Rev. Edward Campbell.....	Presbyterian.....	.....	.....	155,000	14	106	7,000	
1895	Burien College	Greenville, Tex.	Oscar C. Payne.....	Baptist.....	.....	.....	50,000	8	188	9,000	
1850	Butler College	Indianapolis, Ind.	T. C. Howe, Ph. D.....	Christian.....	Blue and White.....	48	670,000	12	88	7,000	
1876	California College	Oakland, Cal.	Arthur R. Macdonald.....	Baptist.....	.....	.....	110,000	12	88	7,000	
1903	Campbell College	Holton, Kan.	Thomas D. Crites, D. D.	U. S. Brethren.....	.....	.....	120,000	16	432	3,500	
1830	Capital University	Columbus, O.	Rev. L. H. Schub, Ph. D.	Lutheran.....	.....	.....	200,000	11	168	7,000	
1866	Carleton College	Norfield, Minn.	W. D. D. D. D.	Methodist.....	Maroon and Blue.....	40	900,000	25	329	23,000	
1846	Carroll College	Waukegan, Wis.	W. O. Carris, D. D.....	Presbyterian.....	.....	50	150,000	10	150	8,000	
1870	Carthage College	Carthage, Ill.	H. D. Hoover, Ph. D.....	Lutheran.....	.....	.....	40	231,000	15	199	8,000
1889	Catholic Univ. of Am.	Washington, D. C.	Rev. Thomas J. Shahan, D. D.	R. Catholic.....	Gold and White.....	75	2,427,359	33	224	70,000	
1828	Cederville College	Cederville, O.	Rev. D. McKinney, D. D.	H. Fresh.....	.....	26	150,000	7	123	4,000	
1823	Centenary Coll. of La.	Shreveport, La.	Rev. R. H. D. D. D.	Meth. Soc.....	.....	.....	150,000	7	123	4,000	
1857	Central College	Fayette, Mo.	W. A. Webb, M. A.....	Meth. Soc.....	.....	.....	450,000	11	170	11,000	
1869	Central N. S. of Ky.	Philadelph., Pa.	R. E. Thompson, LL. D.	Baptist.....	.....	45	900,000	35	345	7,000	
1853	Central Univ. of Iowa	Falla, Ia.	John F. H. H. H.	Presbyterian.....	.....	.....	300,000	50	400	22,000	
1819	Central Univ. of Ky.	Danville, Ky.	F. W. Hinit, Ph. D.....	Presbyterian.....	.....	50-100	800,000	50	400	22,000	
1864	Central Wesleyan Col.	Warrenton, Mo.	Otto E. Kries, D. D.....	Methodist.....	.....	36	300,000	22	329	9,000	
1891	Charles City College	Charles City, Ia.	Rev. F. E. Hirsch, D. D.	Ger. Math.....	.....	38	174,750	16	223	6,000	
1783	College of Charleston	Charleston, S. C.	H. Randolph, LL. D.	R. Catholic.....	.....	.....	650,000	30	503	20,300	
1831	Christian Brothers Col.	St. Louis, Mo.	Rev. Brother Justin, LL. D.	R. Catholic.....	.....	.....	130,000	20	310	6,000	
1871	Christian Brothers Col.	Memphis, Tenn.	Rev. Bro. Edward F. S. C.	R. Catholic.....	.....	.....	175,000	14	162	5,000	
1858	Christian University	Orangeburg, S. C.	Rev. J. M. Danton, D. D.	Methodist.....	.....	20	300,000	40	709	7,000	
1870	Clark University	Atlanta, Ga.	S. E. Ideman, D. D.....	Methodist.....	.....	14	300,000	28	576	000	
1869	Clark University	Worcester, Mass.	G. Stanley Hall, LL. D.	Non-sect.....	.....	100	4,910,000	42	801	85,500	
1881	Coe College	Cedar Rapids, Ia.	J. A. Margie, D. D.....	Non-sect.....	.....	.....	600,000	22	213	6,000	
1813	Colby College	Waterville, Me.	Arthur J. Roberts, M. A.	Baptist.....	.....	.....	754,500	15	268	47,000	
1819	Colgate University	Hamilton, N. Y.	E. B. Bryne, LL. D.	Non-sect.....	.....	60	2,800,000	42	801	85,500	
1874	Colorado College	Col. Springs, Col.	W. B. Stearns, LL. D.	Non-sect.....	Black and Old Gold.....	50	2,325,000	52	678	87,000	
1764	Columbia University	New York City.....	Nicholas M. Butler, LL. D.	Non-sect.....	Light Blue and White.....	150-250	36,022,000	648	7,463	145,000	
1901	Columbia University	Portland, Ore.	Rev. J. Gallagher, C. S. C.	R. Catholic.....	.....	40	200,000	15	170	3,000	
1829	Concordia College	St. Louis, Mo.	Max J. F. Albrecht.....	Lutheran.....	.....	.....	125,000	8	183	8,000	
1881	Concordia College	St. Louis, Mo.	Max J. F. Albrecht.....	Lutheran.....	.....	.....	125,000	8	183	8,000	
1867	Cooper College	Stirling, Kan.	Rev. R. T. Campbell, D. D.	Un. Fresh.....	.....	35	95,000	12	163	5,000	
1853	Cornell College	Mount Vernon, Ia.	Joe E. Harlan, LL. D.	Methodist.....	Royal Purple and White.....	50	994,890	40	775	30,000	
1865	Cornell University	Ithaca, N. Y.....	Jacob G. Schurman, LL. D.	Non-sect.....	Carrollian and White.....	150	15,486,000	636	5,194	354,000	
1889	Cotner University	Bethany, Neb.	William Oeschger, LL. D.	Christian.....	.....	36	1,500,000	138	350	25,000	
1879	Craigton University	Omaha, Neb.	M. P. Downing, E. J.....	R. Catholic.....	Blue and White.....	75-100	300,000	18	220	15,000	
1842	Cumberland University	Lebanon, Tenn.	W. E. Reid, LL. D.	Methodist.....	Royal Blue and White.....	30	345,000	27	543	10,000	
1885	Dakota Wesleyan Uni.	Mitchell, S. D.	Samuel F. Kerfoot, D. D.	Methodist.....	.....	.....	285,500	23	153	17,000	
1900	Dallas College	Dallas, Ore.	Charles A. Mock, Ph. D.	Un. Evang.....	.....	.....	1,800,000	48	75	1,000	
1769	Dartmouth College	Hanover, N. H.	Ernest F. Nichols, D. D.	Non-sect.....	Green.....	125	8,270,000	117	1,229	120,000	
1837	Dartmouth College	Davidson, N. C.	Henry Louis Smith, LL. D.	Presbyterian.....	.....	60	250,000	20	337	20,000	
1903	Davis and Elkins College	Elkins, W. Va.	James B. Allen, M. A.	Presbyterian.....	.....	50	180,000	6	50	2,000	
1833	Delaware College	Newark, Del.	G. A. Harter, Ph. D.	State.....	.....	60	285,500	23	153	17,000	
1831	Denison University	Graville, O.	Emory W. Hunt, LL. D.	Baptist.....	.....	.....	1,780,000	50	1,033	25,000	
1817	De Paul University	Chicago, Ill.	F. J. McConnel, LL. D.	Methodist.....	Old Gold.....	48	1,100,000	18	220	15,000	
1865	Des Moines College	Des Moines, Ia.	D. D. Osborn, Ph. D.	Baptist.....	.....	48	300,000	20	303	6,000	
1877	Detroit College	Detroit, Mich.	Rev. R. D. Stevia, S. J.	R. Catholic.....	.....	.....	775,000	23	580	42,000	
1783	Dickinson College	Carlisle, Pa.	W. E. Reid, LL. D.	Non-sect.....	Red and White.....	.....	1,257,000	35	580	42,500	
1891	Drake University	Des Moines, Ia.	Hill McClelland Bell.....	Non-sect.....	Yale Blue and White.....	50-100	1,037,000	145	1,843	20,000	
1873	Drury College	Springfield, Mo.	Joseph H. George, D. D.	Non-sect.....	Scarlet and Gray.....	40	995,000	25	500	30,000	
1859	Earlham College	Richmond, Ind.	Robert L. Kelly, LL. D.	Friends.....	Yellow and Cream.....	77	700,000	33	620	20,000	
1836	Emory College	Oxford, Ga.	James E. Dieky, D. D.	MethodistSo.	.....	60	800,000	11	296	30,000	
1837	Emory and Henry Col.	Emory, Va.	C. C. Weaver, D. D.	MethodistSo.	.....	50	200,000	16	333	14,000	

## Colleges and Universities of the United States—Continued

FOUNDED	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DENOMINATIONAL CONTROL	COLORS	CERT. OF TUTION	VALUE OF PROPERTY (Including Endowments)	NUMBERS OF INSTRUCTORS	NUMBERS OF STUDENTS	YACHTS IN LIBRARY
1892	Emporia College	Emporia, Kan.	H. C. Culbertson, B. D.	Presbyterian.		\$ 50	\$ 180,000	23	398	10,000
1892	Erskine College	West, S. C.	Rev. J. S. Moffatt, D. D.	A. H. Presb.		60	200,000	10	193	10,000
1893	Evangelical College	Elmhurst, Ill.	Alexander C. Gray, M. A.	Presb. Prot.		27.50	250,000	22	402	20,000
1871	Evangelical College	Elmhurst, Ill.	Rev. D. Irion, D. D.	Ger. Evang.			50,000	8	136	2,000
1892	Evangelical College	Elmhurst, Ill.	J. A. Leavitt, D. D.	Baptist		30	100,000	16	250	10,000
1897	Fairmount College	Fairmount, D. C.	Rev. E. Thayer, D. D.	Presbyterian		40	300,000	12	210	31,000
1897	Fargo College	Fargo, N. D.	C. C. Creagan, M. A.	Congregat'l		32	350,000	24	355	6,000
1892	Findlay College	Findlay, O.	Rev. C. I. Brown, D. D.	Ch. of God.		38	150,000	17	400	2,000
1892	Fisk University	Nashville, Tenn.	George A. Gates, L. L. D.	Congregat'l		17	420,000	62	653	9,000
1841	Fordham University	Fordham, N. Y.	Rev. D. J. Quinn, S. J.	R. Catholic.	Maroon	100	3,000,000	116	450	75,000
1841	Fort Worth University	Fort Worth, Tex.	Rev. W. Fielder, D. D.	Methodist.		50	200,000	35	671	13,400
1893	Franklin College	Franklin, Ind.	A. M. Campbell	Non-sect.		40	40,000	10	93	2,700
1834	Franklin College	Franklin, Ind.	M. E. Crowell, M. A.	Baptist.	Blue and White	54	500,000	22	360	17,000
1787	Franklin & Marshall	Lancaster, Penn.	Rev. Henry H. Appel, D. D.	Reformed.		None	768,000	27	391	45,000
1893	Frederick College	Frederick, Md.	Perceval Hall, Ph. D.	R. Catholic.		11	166			
1851	Furman University	Greenville, S. C.	Edwin M. Potest, D. D.	Baptist.		60	325,000	15	308	7,000
1851	Gale College	Galeville, Wis.	Lars M. Gimmestad	Lutheran			40,000	6	108	3,000
1844	Gallatin College	Kendall Green, D. C.	Rev. W. H. George	Rel. Presb.		60	400,000	17	290	4,000
1859	Geneva College	Georgetown, Ky.	Arthur Yager, L. L. D.	Baptist.		15	216,000	144	560	102,500
1820	Georgetown University	Washington, D. C.	Rev. J. J. Himmell, S. J.	R. Catholic.	Blue and Gray	100-150	1,138,510	185	1,508	40,000
1821	Geo. Washington U.	Washington, D. C.	Charles H. Stockton, L. L. D.	Non-sect.	Blue and Gray					
1857	German College	Mount Pleasant, N. C.	Rev. H. G. Leist	Methodist				12	156	2,000
1893	Geneva College	Geneva, N. Y.	Rev. E. H. Fink, S. J.	R. Catholic.			200,000	25	425	20,000
1893	Geneva College	Spokane, Wash.	Rev. Louis Teilmann, S. J.	R. Catholic.			500,000	25	425	20,000
1893	Grace College	Lamoni, Ia.	J. A. Gunckley, B. Sc.	Non-sect.			35,000	12	120	5,000
1892	Grand Island College	Grand Island, Neb.	George Sutherland	Baptist			200,000	20	364	5,000
1892	Greenville College	Greenville, Ill.	E. G. Burritt, M. A.	Free Meth.			115,000	19	370	5,000
1847	Grinnell College	Grinnell, Ia.	John H. T. Mann, Ph. D.	Non-sect.	Scarlet and d			55	640	
1878	Grove City College	Grove City, Penn.	Rev. I. C. Kotler, L. L. D.	Non-sect.	Black	60	1,034,000	55	640	
1892	Guilford College	Guilford College, N. C.	Lewis L. Hobbs, L. L. D.	Friends		50	425,000	25	726	6,000
1892	Guiney College	Guiney, N. Y.	Rev. C. A. Mattson, Ph. D.	Non-sect.	Red and Gray	30-50	200,000	11	236	4,000
1812	Hamilton College	Clinton, N. Y.	Rev. M. W. Striker, L. L. D.	Non-sect.		90	1,400,000	19	187	80,000
1854	Hamilton University	St. Paul, Minn.	Rev. G. H. Bridgman, L. L. D.	Methodist		37	750,000	17	365	5,000
1854	Hampden-Sydney College	Hampden-Sydney, Va.	Henry T. Graham, D. D.	Presbyterian		50	380,000	18	17,000	
1828	Hanover College	Hanover, Ind.	Wm. A. Mills, L. L. D.	Presbyterian		None	400,000	16	213	22,000
1893	Harvard University	Cambridge, Mass.	A. Lawrence Lowell, L. L. D.	Non-sect.	Crimson	150	32,000,000	612	5,108	85,278
1893	Hastings College	Hastings, Neb.	Rev. E. Turner, L. L. D.	Baptist		50	225,000	13	152	8,000
1853	Haverford College	Haverford, Penn.	Isaac Sharpless, L. L. D.	Friends		150	3,000,000	21	168	53,000
1840	Heidelberg University	Tiffin, O.	Charles E. Miller, D. D.	Reformed.	Black, Orange, and Red	60	450,000	25	367	15,000
1898	Henderson College	Arkadelphia, Ark.	J. H. Hinesmoe, M. A.	Methodist			150,000	15	250	10,000
1844	Hendrix College	Conway, Ark.	A. C. Miller, D. D.	Methodist		60	270,000	9	168	10,500
1893	Henry Russell College	Henry, N. C.	Rev. H. Gordon	Presb. Prot.			200,000	22	350	29,000
1853	Highland University	Highland, Kan.	W. C. J. Adams, Ph. D.	Presbyterian			104,000	12	135	5,000
1855	Hillsdale College	Hillsdale, Mich.	J. W. Mauck, L. L. D.	Free Baptist.	Ultramarine, (Blue), and Red	27	382,199	21	366	17,300
1850	Hiram College	Hiram, O.	Miner Lee Bates, M. A.	Non-sect.	Orange	48	350,000	22	399	12,000
1828	Robert College	Geneva, N. Y.	Rev. L. C. Stewardson, L. L. D.	Non-sect.	Purple	100	1,187,928	22	110	46,387
1843	Holy Cross, Col. of the	Worcester, Mass.	Rev. T. E. Murphy, S. J.	R. Catholic.		60	500,000	20	360	36,000
1878	Holy Ghost, Col. of the	Pittsburg, Penn.	Rev. M. A. Hehr, L. L. D.	R. Catholic.		24	500,000	17	375	15,000
1892	Hopewell College	Kansas City, Kan.	Andrew P. Montague, L. L. D.	Baptist		60	250,000	10	178	
1897	Howard University	Washington, D. C.	Rev. W. P. Thirkield, L. L. D.	National.	Dark Blue and White	None	2,328,497	121	1,203	61,200
1840	Howard Payne College	Brownwood, Tex.	R. H. Hamilton, M. A.	Baptist		50	190,000	18	418	2,000
1852	Huron College	Huron, S. D.	Rev. C. H. French, D. D.	Presbyterian		40	295,000	18	466	5,000
1829	Hillsdale College	Illinois Wesleyan Uni.	C. H. Rammick, Ph. D.	Methodist	Green and White	52	462,000	50	756	10,000
1892	Immaculate Concept	New Orleans, La.	Rev. F. M. Matten, S. J.	R. Catholic.			360,000	26	360	24,000
1847	Indiana University	Bloomington, Ind.	W. L. Bryan, Ph. D., L. L. D.	State.	Crimson and d	None	1,600,000	301	2,470	70,650
1841	Iowa Wesleyan U.	Mount Pleasant, Ia.	Edwin A. Schell	Methodist	White and Purple	45	250,000	27	399	10,000
1891	Jefferson College	Convent, La.	Rev. R. H. Smith, M. S. C.	R. Catholic.			175,000	19	175	9,500
1897	John B. Stetson U.	De Land, Fla.	Lincoln Bailey, Ph. D.	Non-sect.	Green and White	72-60	700,000	49	581	15,000
1870	Johns Hopkins U.	Baltimore, Md.	Ira Remsen, L. L. D.	Non-sect.	Black and Gold	150-200	6,520,000	200	710	143,000
1870	Junata College	Huntingdon, Penn.	M. C. Brumbaugh, L. L. D.	Ger. Baptist.		39-58	277,750	23	373	28,000
1893	Kansas Christian U.	Neola, Kan.	Rev. H. Stephens, M. S. C.	Christian	Blue and White		200,000	16	348	3,000
1893	Kansas City University	Kansas City, Kan.	Rev. D. S. Stephens, D. D.	Meth. Prot.	Purple and Orange		400,000	56	447	3,000
1799	Kentucky University	Lexington, Ky.	H. S. Barker, L. L. D.	Christian			1,000,000	63	1,107	45,000
1848	Kentucky Wesleyan	Winchester, Ky.	John J. Tigert, M. A.	Methodist		50	200,000	9	150	3,500
1824	Kenyon College	Gambier, O.	Rev. W. F. Pierce, L. H. D.	Prot. Epis.		75	1,000,555	14	125	45,000
1843	Knox College	Galesburg, Ill.	Henry McDaniel, D. D.	Presbyterian		80	549,074	32	683	9,000
1875	Knoxville College	Knoxville, Tenn.	Rev. W. McGarran, L. L. D.	N. Presb.		7-50	185,000	34	483	3,000
1825	Lafayette College	Easton, Pa.	Rev. E. D. Wardell, L. L. D.	Presbyterian	Maroon and d	None	1,598,102	67	451	30,000
1893	La Fayette College	La Fayette, Ala.	John P. Neff, M. A.	Non-sect.	White	100	45,000	9	235	2,100
1854	La Grange College	La Grange, Mo.	John W. Crouch	Baptist			75,000	12	168	5,000
1857	Lake Forest College	Lake Forest, Ill.	John S. Nollen, Ph. D.	Presb. Prot.	Blue and White	50	1,307,214	17	189	22,000
1895	La Salle College	Philadelphia	Rev. Brother Wolfred	R. Catholic.	Black		150,000	14	163	12,500
1845	Lawrence University	Appleton, Wis.	Rev. S. Flinta, D. D.	Non-sect.	White and Yellow	46	1,113,640	41	711	20,100
1893	Leander Clark College	Toledo, Ia.	Franklin F. Brookes, D. D.	N. Presb.		40	275,000	17	315	6,000
1893	Lebanon Valley College	Lebanon, Pa.	Rev. L. K. D. D.	Presb. Prot.	Blue and White	60-150	3,900,000	66	720	125,000
1891	Lehigh University	South Bethlehem, Pa.	Henry S. Drinker, L. L. D.	Non-sect.			250,000	21	268	
1891	Lehigh University	Palo Alto, Cal.	Daniel Starr Jordan, L. L. D.	Non-sect.	Cardinal	None	30,000,000	170	1,600	127,000
1891	Lehigh University	Lehigh, Pa.	Rev. E. F. Frits, L. L. D.	Presbyterian		100	160,000	14	215	3,500
1846	Leont College	Hopkinton, Ia.	Rev. E. F. Reed, D. D.	Presbyterian		30-50	188,412	13	157	5,350
1893	Lima College	Lima, O.	Charles Christian Miller	Presbyterian		36	260,000	17	285	4,000
1893	Lincoln College	Lincoln, N. C.	John H. McMurphy, Ph. D.	Presb. Prot.			750,000	14	196	15,000
1893	Livingstone College	Salisbury, N. C.	Rev. L. H. Grier, L. L. D.	Non-sect.			180,000	21	306	7,000
1841	Lombard College	Galesburg, Ill.	Rev. L. B. Fisher, D. D.	Universalist.		36	400,000	14	125	7,000

## Colleges and Universities of the United States—Continued

FOUNDED	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DENOMINATIONAL CONTROL	COLORS	COST OF TUITION	VALUE OF PROPERTY (including Endowment)	NUMBERS OF INSTRUCTORS	NUMBERS OF STUDENTS	VOLUMES IN LIBRARY	
1860	Louisiana State College	Baton Rouge, La.	T. D. Boyd, LL. D.	Non-sect.	.....	\$60	\$ 310,000	21	303	41,000	
1862	Loyola College	Baltimore, Md.	Rev. F. X. Brady, S. J.	R. Catholic.	.....	32	625,000	21	162	10,600	
1864	Macalester College	St. Paul, Minn.	T. More Hodgman, LL. D.	Presbyterian.	Green and White.....	75-100	464,232	16	260	11,600	
1835	Marietta College	Marietta, O.	Rev. A. T. Perry, D. D.	Non-sect.	Navy Blue and White.....	30	600,000	30	422	60,000	
1879	Maryville College	Maryville, Tenn.	Rev. S. T. Wilson, D. D.	Presbyterian.	Orange and d.....	18	750,000	32	690	12,500	
1828	McKendree College	Lebanon, Ill.	John F. Harmon, D. D.	Methodist.	.....	45	190,000	14	253	8,000	
1857	McKinninville College	McMinnville, Ore.	Leonard W. Riley, D. D.	Baptist.	.....	61	125,000	16	220	4,500	
1859	Morehead University	Macon, Ga.	Samuel Y. Jameson.	Baptist.	.....	80	789,437	60	550	28,000	
1869	Middlebury College	Middlebury, Vt.	John M. Thomas, D. D.	Non-sect.	White.....	None	825,000	60	550	28,000	
1867	Miligan College	Miligan, Tenn.	Frederick D. Krahner, M. A.	Ducist Christ.	.....	40	50,000	14	228	6,000	
1869	Milton College	Milton, Wis.	Rev. Wm. C. Daland, M. D.	Seven D. Bap.	.....	40	187,383	14	159	8,500	
1826	Mississippi College	Clinton, Miss.	R. A. Meier, D. D.	Reformed.	.....	.....	100,000	18	112	10,000	
1867	Missouri Valley College	Marshall, Mo.	Rev. W. T. Lowrey, D. D.	Baptist.	.....	40	250,000	13	354	8,000	
1867	Missouri Wesleyan College	Cameron, Mo.	Il. H. De Bray, D. D.	Methodist.	.....	27-37	150,000	18	313	9,000	
1858	Monmouth College	Monmouth, Ill.	T. H. McMichael, D. D.	Un. Presb.	.....	51	496,478	25	449	6,000	
1854	Moore Hill College	Moore Hill, Ind.	Harry A. King, M. A.	Methodist.	.....	48	400,000	15	250	9,000	
1894	Morningside College	Sions City, Ia.	Luther Freeman, D. D.	Methodist.	.....	48	750,000	35	570	7,000	
1862	Morris Brown College	Atlanta, Ga.	Rev. E. W. Lee, D. D.	African M. E.	.....	8.50	150,000	31	783	3,000	
1865	Morris Harvey College	Barboursville, W. Va.	D. W. Shaw, M. A.	Methodist.	.....	.....	100,000	9	150	.....	
1872	Morrisville College	Morrisville, Mo.	Brother Isadore	Methodist.	.....	.....	200,000	15	170	5,700	
1898	Mount St. Joseph's Col.	Emmitsburg, Md.	Very Rev. D. Flynn, LL. D.	R. Catholic.	.....	800	300,000	40	125	12,000	
1868	Mount Union College	Alliance, O.	Rev. Wm. J. McMaster, M. A.	Methodist.	Royal Purple.	54	325,000	20	554	12,000	
1867	Muhlenberg College	Allentown, Penn.	Rev. J. A. W. Haas, D. D.	Lutheran.	.....	75	605,542	14	122	17,000	
1867	Muskingum College	New Concord, O.	Rev. J. K. Montgomery, D.D.	Un. Presb.	.....	45	175,000	20	470	5,000	
1868	Nebraska Wesleyan Col.	University Place, Neb.	Wm. J. Davidson, M. S. C.	Methodist.	Yellow and Brown.....	36	500,000	43	800	8,000	
1843	New Windsor College	New Windsor, Md.	Rev. J. Fraser, Ph. D., LL. D.	Presbyterian.	.....	65,000	500,000	251	4,100	85,000	
1830	New York University	New York, N. Y.	Elmer E. Brown, LL. D.	Non-sect.	Violet.....	100-200	5,200,000	231	4,100	85,000	
1847	New York Col. of the City	New York, N. Y.	John H. Finley, LL. D.	City.....	.....	.....	5,500,000	232	3,736	39,500	
1856	Niagara University	Niagara Falls, N. Y.	Very Rev. E. J. Walsh, C.M.	Il. Catholic.	Purple and White.....	100	600,000	31	300	20,000	
1860	Northern Illinois Coll.	Fulton, Ill.	J. F. Bittinger, A. M.	Non-sect.	.....	.....	700,000	6	187	1,000	
1861	Northwestern College	Naperville, Ill.	Rev. Thomas Bowman, D.D.	Evang. Ass'n.	.....	54-60	475,000	23	450	10,000	
1851	Northwestern Univ.	Evanston, Ill.	Abram W. Harris, LL. D.	Methodist.	Royal Purple.	100-175	9,000,000	378	4,283	187,599	
1865	Northwestern Univ.	Albany, N. Y.	August F. Edgar, D. D.	Lutheran.	.....	40	65,000	12	56	4,000	
1862	Northwest Mo. College	Albany, Mo.	James Ralph Clay	Methodist, So.	.....	.....	50,000	8	151	1,400	
1861	Norwegian Luther Coll.	Decorah, Ia.	Rev. C. K. Frenn.	Lutheran.	.....	.....	145,000	14	167	15,200	
1819	Norwich University	Norwich, Vt.	Rev. C. K. Frenn.	Non-sect.	.....	65	310,000	31	380	10,000	
1863	Oberlin College	Oberlin, O.	Rev. H. C. Kim, D.D., LL. D.	Non-sect.	.....	73	5,884,723	133	2,025	105,021	
1868	Occidental College	Los Angeles, Cal.	John W. Barr, LL. D.	Presbyterian.	.....	.....	500,000	33	400	7,000	
1877	Ogden College	Ogden, Ky.	Charles Lee, M. A.	Non-sect.	State.....	.....	150,000	8	81	1,000	
1870	Ohio State University	Columbus, O.	W. O. Thompson, LL. D.	State.....	Scarlet and d.....	.....	4,500,000	274	2,686	90	
1804	Ohio University	Athens, O.	Alston Ellis, LL. D.	State.....	Orange, Green and White.....	None	1,000,000	57	1,462	80,000	
1844	Ohio Wesleyan Univ.	Delaware, O.	Herbert Welch, LL. D.	Methodist	.....	15	1,500,000	123	1,277	88,000	
1844	Olivet College	Olivet, Mich.	E. G. Lancaster, Ph. D.	Non-sect.	.....	50	500,000	30	265	33,000	
1865	Ottawa University	Ottawa, Kan.	Julius Eber-Prize, D. D.	Non-sect.	Cardinal and Tan.....	47	350,000	20	450	5,500	
1847	Otterbein University	Westerville, O.	W. G. Clippinger, B. D.	Un. Brethren	.....	53	385,981	32	500	13,000	
1886	Ouachita College	Arkadelphia, Ark.	H. S. Hartgro, LL. D.	Baptist	.....	50	160,000	30	400	12,000	
1891	Pacific College	Newberg, Ore.	W. J. Heagan, M. A.	Friends	.....	.....	50,000	9	138	2,000	
1849	Pacific University	Forest Grove, Ore.	Wm. N. Fernald, LL. D.	Congregat.	.....	26-30	406,000	23	245	15,360	
1875	Park College	Parkville, Mo.	L. M. McAfee, LL. D.	Non-sect.	.....	20-30	830,000	25	372	16,000	
1868	Parker College	Winnebago City, Minn.	E. W. Van Allen, D. D.	Free Baptist.	.....	30	90,000	10	148	3,200	
1875	Parsons College	Fairfield, Ia.	Rev. W. S. Parsons, D. D.	Presbyterian.	.....	40	249,106	20	263	8,000	
1873	Penn College	Oakalocan, Ia.	D. M. Edwards, Ph. D.	Friends	.....	40	249,106	20	263	8,000	
1832	Pennsylvania College	Gettysburg, Penn.	W. A. Graessley, Ph. D.	Lutheran	.....	30	575,000	16	246	30,000	
1862	Pennsylvania Military College	Carlisle, Pa.	Charles E. Hyatt, C. E.	Non-sect.	.....	550	176,000	16	119	2,000	
1855	Pennsylvania State	State College, Penn.	Edwin E. Sparks, Ph.D., LL. D.	State.....	Navy Blue and White.....	None	2,163,999	148	1,400	38,000	
1877	Philander Smith Col.	Little Rock, Ark.	Rev. J. M. Cox, D. D.	Methodist.	.....	16	40,000	20	131	5,000	
1905	Phi Kappa Coll.	Philmont, Ore.	O. V. White, M. S. C.	Un. Brethren	.....	.....	15,000	8	130	1,000	
1868	Phi Kappa Coll.	Bowling Green, Mo.	M. M. Collins, M. A.	Non-sect.	.....	28	250,000	18	209	9,000	
1866	Polychrome College	Brooklyn, N. Y.	Rev. W. H. Stearns, D.D.	Non-sect.	Blue and Gray.....	200	1,008,301	23	485	8,500	
1854	Poly. Inst. of B'klyn	Brooklyn, N. Y.	F. W. Atkinson, Ph. D.	Non-sect.	.....	.....	823,580	37	331	12,600	
1868	Pomona College	Claremont, Cal.	James A. Haiseld	Non-sect.	Cadmus Yellow.....	3-75	40	140,000	8	78	2,500
1847	Port Institute	Brooklyn, N. Y.	C. M. Pratt, M. A.	Non-sect.	Orange and d.....	150-160	.....	169	1,393	257,800	
1890	Presbyterian of S. C.	Clinton, S. C.	Rev. R. Adams, D. D.	Presbyterian.	.....	.....	120,000	10	110	3,000	
1746	Princeton University	Princeton, N. J.	Frederick D. Stewart, M. A.	Non-sect.	.....	75	632,180	42	110	11,000	
1868	Prichett College	Glasgow, Mo.	Uriel R. Hall, M. A.	Non-sect.	.....	.....	40,000	6	50	3,000	
1830	Randolph-Macon Col.	Richmond, Va.	George W. Macmillan, Ph. D.	Non-sect.	.....	75	632,180	13	140	11,000	
1835	Richmond College	Richmond, Va.	Rev. W. Boatwright, LL. D.	Baptist.	.....	70	750,000	25	320	15,200	
1876	Rio Grande College	Ripon, Wis.	Philip Merrill, Ph. D.	Free Baptist.	.....	30	601,486	25	300	20,000	
1851	Ripon College	Ripon, Wis.	Philip Merrill, Ph. D.	Non-sect.	.....	30	601,486	25	300	20,000	
1853	Roanoke College	Salem, Va.	Rev. J. A. Morehead, Ph. D.	Lutheran	.....	50	350,000	20	290	24,000	
1856	Rock Hill College	Rock Hill, S. C.	Rev. Bro. M. A. Mendenhall, D.D.	R. Catholic.	.....	60	350,000	21	204	9,000	
1865	Rollins College	Winter Park, Fla.	W. F. Blackman, Ph. D.	Non-sect.	.....	60	350,000	20	290	24,000	
1867	Roth University	Holly Springs, Miss.	Rev. J. T. Docking, D. D.	Methodist.	.....	.....	150,000	21	444	5,000	
1866	Rutgers College	New Brunswick, N. J.	Rev. W. H. Stearns, D.D.	Non-sect.	Scarlet.....	80	150,000	42	410	60,000	
1868	Sacred Heart College	Denver, Col.	John J. Brown, S. J.	R. Catholic.	.....	.....	150,000	18	199	10,000	
1893	St. Anselm's College	Manchester, N. H.	Hilary Piranelli, D. D.	R. Catholic.	.....	.....	150,000	22	115	5,000	
1891	St. Bede's College	St. Bede's, Cal.	Rev. Rev. J. Schmitt	R. Catholic.	.....	200	150,000	11	159	6,000	
1858	St. Benedict's College	Atchison, Kan.	Rev. Rev. Innocent Wolf.	R. Catholic.	.....	.....	250,000	30	290	20,000	
1868	St. Benedict's College	Newark, N. J.	O. R. B. D. D.	R. Catholic.	.....	.....	100,000	14	124	9,500	
1892	St. Bernard College	St. Bernard, Ala.	Rev. R. B. Menges, O. S. B.	R. Catholic.	.....	.....	100,000	25	139	6,000	
1859	St. Bonaventure's Col.	Allegany, N. Y.	Very Rev. J. F. Butler, O. F. M.	R. Catholic.	.....	.....	400,000	20	290	20,000	

## Colleges and Universities of the United States—Continued

FOUNDED	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DENOMINATIONAL CONTROL	COLORS	COST OF TUITION	VALUE OF PROPERTY (Including Endowment)	NUMBER OF INSTRUCTORS	NUMBER OF STUDENTS	VOLUMES IN LIBRARY
1848	St. Charles College	Elliot City, Md.	Rev. F. X. McKeen, M. A.	R. Catholic.	.....	.....	\$150,000	17	210	15,000
1860	St. Francis Solanus	Quincy, Ill.	Fortunatus Hammer, O. F. M.	R. Catholic.	.....	.....	253,000	17	200	8,000
1847	St. Francis Xavier	New York, N. Y.	Rev. T. J. McCuskey, S. J.	R. Catholic.	Maroon and Blue	\$100	850,000	41	552	25,000
1846	St. Ignatius College	Cleveland, O.	Rev. G. J. Pielke, S. J.	R. Catholic.	.....	.....	224,482	24	330	14,500
1794	St. John's College	Annapolis, Md.	Thomas Fell, L. L. D.	Non-sect.	.....	75	360,000	14	180	10,000
1866	St. John's College	Washington, D. C.	Rev. J. F. Andrew, F. R. C.	R. Catholic.	.....	.....	150,000	12	160	5,000
1841	St. John's College	New York, N. Y.	Rev. J. J. Collins, S. J.	R. Catholic.	.....	.....	1,000,000	27	440	38,000
1868	St. John's College	Brooklyn, N. Y.	Very Rev. J. W. Moore, C. M.	R. Catholic.	.....	.....	50,000	23	265	12,000
1863	St. John's Lutheran	Winfield, Kan.	Adolphus W. Mayer, D. D.	Lutheran	.....	.....	350,000	40	325	2,500
1867	St. John's University	Collegeville, Minn.	Rt. Rev. P. Engel, Ph. D.	R. Catholic.	.....	.....	620,000	20	258	8,000
1872	St. Joseph's College	Dubuque, Ia.	Very Rev. D. M. Gorman	R. Catholic.	.....	.....	800,000	70	512	35,000
1856	St. Lawrence University	Canton, N. Y.	A. Gunnison, L. L. D.	Universalist	Sea green and Brown	60	60,000	7	60	7,000
1880	St. Leo College	St. Leo, Fla.	Rt. Rev. C. H. Mohr, O. S. B.	R. Catholic.	.....	.....	600,000	70	512	35,000
1829	St. Louis University	St. Louis, Mo.	Very Rev. John F. Frieden	R. Catholic.	Blue and White	60-150	.....	210	1,169	45,000
1821	St. Mary's College	St. Mary, Ky.	Rev. M. Jaglowicz, C. R.	R. Catholic.	.....	.....	125,000	12	148	6,500
1878	St. Mary's College	Belmont, N. C.	Rt. Rev. L. Hadd, O. S. B.	R. Catholic.	.....	60	100,000	30	123	8,000
1848	St. Mary's College	St. Mary's, Kan.	Rev. A. J. Breen, S. J.	R. Catholic.	.....	60	350,000	45	440	23,000
1837	St. Meinrad College	St. Meinrad, Ind.	Rt. Rev. A. Schmitt, O. S. B.	R. Catholic.	.....	.....	204,000	17	138	22,000
1874	St. Olaf College	Norfield, Minn.	Rev. John N. Kildahl	R. Catholic.	.....	20	204,000	18	263	10,000
1878	St. Peter's College	Jersey City, N. J.	Rev. E. J. Magrath, S. J.	R. Catholic.	.....	.....	200,000	18	263	10,000
1860	St. Stephen's College	Annapolis, N. Y.	Rev. W. C. Rodgers, D. D.	Prot. Epip.	.....	250	333,000	9	83	18,850
1866	St. Vincent's College	Norfolk, Va.	Rev. J. S. Glass, D. D.	R. Catholic.	.....	.....	1,000,000	27	530	5,000
1865	St. Vincent's College	Los Angeles, Cal.	Very Rev. J. S. Glass, D. D.	R. Catholic.	.....	.....	.....	.....	.....	.....
1831	St. Xavier College	Cincinnati, O.	Rev. J. Grimmelmann	R. Catholic.	.....	.....	.....	.....	.....	.....
1851	Santa Clara College	Santa Clara, Cal.	Very Rev. F. J. Mooney	R. Catholic.	.....	.....	.....	.....	.....	.....
1878	Seabright Coll. Institute	Neenah, Mo.	J. T. Pritchett, M. A.	Methodist.	.....	45	50,000	15	311	3,000
1857	Seis College	Seis, O.	Robert E. Reeban, D. D.	Methodist.	.....	.....	.....	.....	.....	.....
1850	Seton Hall College	South Orange, N. J.	Very Rev. R. F. Mooney	R. Catholic.	.....	380	500,000	20	215	25,000
1865	Shaw University	Raleigh, N. C.	Rev. C. F. Messervy, L. L. D.	Baptist	Blue	.....	123,400	39	488	5,200
1868	Shurtleff College	Upper Merion, Ill.	J. D. R. Riple, L. H. D.	Baptist	Green and Gold	34	250,000	8	115	10,000
1868	Simpson College	Indianola, Ia.	C. E. Shelton, L. L. D.	Methodist.	.....	66	213,000	25	929	5,100
1844	S. Carolina M. U. Ar.	Charleston, S. C.	Col. O. J. Bond, M. A. Supr.	State	.....	40	125,000	13	311	6,000
1856	Southern University	Greensboro, Ala.	Rev. S. M. Hosmer, D. D.	Methodist So.	.....	.....	305,000	13	149	8,500
1875	Southern Fresh. Univ.	Clarksville, Tenn.	Wm. D. Whitfield, D. D.	Presbyterian	.....	60	360,000	9	117	8,000
1870	Spring Hill College	Andover, N. C.	Rev. A. N. Twining, M. A.	Lutheran	.....	.....	50,000	14	178	5,000
1861	Stanford Graded Col.	Stanford, Cal.	W. J. Ireland	Non-sect.	.....	.....	.....	.....	.....	.....
1861	State Col. for Cold Stu.	Dover, Del.	William C. Jason, M. A.	State	.....	.....	35,000	9	120	1,000
1861	Stratford University	Stratford, Conn.	Rev. C. G. Butler, D. D.	Congregational	.....	.....	200,000	29	705	4,000
1865	Susquehanna Univ.	Salisburg, Penn.	Rev. C. T. Atkins, D. D.	Lutheran	.....	51	300,000	22	279	12,000
1860	Swarthmore College	Swarthmore, Penn.	Joseph Swan, L. L. D.	Friends	Garnet	150	1,447,980	40	360	29,900
1860	Syracuse University	Syracuse, N. Y.	Rev. J. R. Dewey, D. D.	Non-sect.	Orange	70-125	4,838,885	240	3,248	78,400
1857	Tabor College	Tabor, Ia.	Frederick W. Long, M. A.	Congregational	.....	45	300,000	15	192	13,500
1868	Tarleton College	Tarleton, Mo.	Rev. A. A. Thompson	Methodist	.....	40	222,414	31	497	5,000
1890	Taylor University	Upland, Ind.	Rev. M. Vaythring, D. D.	Methodist.	.....	48	90,000	17	206	7,000
1884	Temple University	Philadelphia, Penn.	Rev. R. H. Conwell, L. L. D.	Non-sect.	Cherry and White	5-150	599,972	212	3,479	5,500
1870	Thiel College	Greenville, Penn.	C. T. Benise, D.	Lutheran	.....	36	135,000	9	90	5,000
1798	Transylvania Univ.	Lexington, Ky.	R. H. Crossfield, Ph. D.	Non-sect.	.....	100	2,065,000	22	220	58,000
1863	Trinity College	Hartford, Conn.	R. H. Luther, L. L. D.	Non-sect.	.....	50	1,176,281	37	208	40,000
1853	Trinity College	Durham, N. C.	Wm. F. Few, Ph. D.	Methodist So.	.....	70	200,000	18	262	5,000
1860	Trinity University	Nashville, Tenn.	S. L. Hornbeck, L. L. D.	Presbyterian	.....	.....	.....	.....	.....	.....
1862	Tulia College	Medford, Mass.	F. W. Hamilton, L. L. D.	Universalist	Brown and Blue	100-150	2,581,461	225	1,150	61,000
1834	Tulane University of Louisiana	New Orleans, La.	E. B. Craighead, D. C. L.	State	.....	85	7,317,187	192	2,440	55,000
1887	Union College	Barbourville, Ky.	James Warren Easley	Methodist	.....	40	408,061	11	216	1,300
1891	Union College	College View, Neb.	Frederick Griggs, M. A.	Severn, D. Ad.	.....	40-50	200,000	35	995	3,000
1859	Union Christian Col.	Marion, Ind.	O. B. Whitaker, D. D.	Christian	.....	33	200,000	15	167	3,000
1875	Union University	Sevierhead and Albany, N. Y.	Rev. C. A. Richmond, D. D.	Non-sect.	Crimson and White	60	1,700,000	27	345	40,000
1821	Univ. of Alabama	University, Ala.	J. W. Abernethy, L. L. D.	State	.....	20	1,650,000	53	603	25,000
1821	Univ. of Arkansas	Fayetteville, Ark.	John P. Tullman, L. L. D.	State	Blue and Red	20	325,000	34	171	5,000
1845	Univ. of Buffalo	Buffalo, N. Y.	Charles F. Norton, L. L. D.	Non-sect.	.....	.....	2,000,000	99	109	8,340
1841	Univ. of California	Berkeley, Cal.	John L. Hays, L. L. D.	Non-sect.	.....	.....	2,000,000	99	109	8,340
1890	Univ. of Chicago	Chicago, Ill.	H. P. Judson, L. L. D.	State	Blue and Gold	100-200	25,900,103	330	3,639	491,481
1819	Univ. of Cincinnati	Cincinnati, O.	C. W. Danahy, L. L. D.	Baptist	Red and Black	City	3,300,000	145	1,734	104,000
1863	Univ. of Colorado	Boulder, Col.	Rev. H. J. D. Buechel, L. L. D.	Methodist.	Silver and Gold	.....	922,450	138	1,150	48,000
1864	Univ. of Denver	Denver, Col.	A. A. Murphree, L. L. D.	State	Crimson and Gold	45-100	821,000	160	1,500	23,000
1884	Univ. of Florida	Gainesville, Fla.	D. C. Barrow, L. L. D.	State	.....	50	1,500,000	199	3,375	35,000
1783	Univ. of Georgia	Athens, Ga.	J. A. McLean, L. L. D.	State	.....	.....	1,000,000	50	625	22,000
1849	Univ. of Idaho	Moscow, Idaho	E. J. James, L. L. D.	State	.....	100-175	3,942,531	551	4,708	150,000
1867	Univ. of Illinois	Urbana, Ill.	J. G. Bowman, Ph. D.	State	.....	20-50	2,896,500	150	2,472	87,700
1847	Univ. of Iowa	Iowa City, Ia.	Frank Strong, Ph. D.	State	.....	10-35	1,500,000	37	2,155	65,000
1864	Univ. of Kansas	Lawrence, Kan.	John Patterson, L. L. D.	Non-sect.	.....	100	250,000	147	856	3,000
1907	Univ. of Louisville	Louisville, Ky.	Robert J. Aley, L. L. D.	Non-sect.	.....	60	888,360	93	801	40,000
1865	Univ. of Maine	Orono, Me.	Harry B. Hutchins, L. L. D.	State	.....	60	3,195,000	360	5,213	241,128
1837	Univ. of Michigan	Ann Arbor, Mich.	George E. Vincent, L. L. D.	State	.....	.....	.....	.....	.....	.....
1868	Univ. of Minnesota	Minneapolis, Minn.	A. A. Kincaid, L. L. D.	State	.....	20-150	6,500,000	239	4,272	135,000
1848	Univ. of Mississippi	University, Miss.	C. R. Hull, Ph. D., L. L. D.	State	.....	50-75	1,575,000	16	108	25,000
1830	Univ. of Missouri	Columbia, Mo.	A. H. Dunn, Ph. D.	State	.....	20	1,664,975	186	2,855	96,600
1895	Univ. of Montana	Missoula, Mont.	John J. D. Hinds, L. L. D.	Non-sect.	.....	.....	.....	.....	.....	.....
1785	Univ. of Nashville	Nashville, Tenn.	Samuel Avery, Ph. D.	Non-sect.	.....	.....	.....	.....	.....	.....
1869	Univ. of Nebraska	Lincoln, Neb.	.....	State	.....	.....	3,000,000	200	3,611	68,000

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1874	Univ. of Nevada.....	Reno, Nev.....	J. E. Stubbs, LL. D.....	State.....	Royal Blue and Silver.....	None	\$ 750,000	38	312	16,700
1889	Univ. of New Mexico.....	Albuquerque, N. M.....	Edward McQueen Gray.....	State.....	White and Blue.....	.....	136,000	16	121	8,000
1889	Univ. of North Carolina.....	Chapel Hill, N. C.....	F. P. Venable, LL. D.....	State.....	White and Blue.....	\$ 60	1,003,500	94	944	825
1883	Univ. of North Dakota.....	Grand Forks, N. D.....	Frank H. Meyer, Ph. D.....	State.....	Pink and Green.....	.....	600,000	84	906	35,000
1842	Univ. of Notre Dame.....	Notre Dame, Ind.....	Very Rev. J. Cavanaugh, C. S. C.....	R. Catholic.....	Old Gold and Marine Blue.....	100	1,500,000	70	1,000	60,000
1892	Univ. of Oklahoma.....	Norman, Okla.....	Rev. A. Grant Evans.....	State.....	Crimson and Cream.....	None	10,000,000	65	696	20,000
1872	Univ. of Oregon.....	Eugene, Ore.....	Prince L. Campbell, M. A.....	State.....	Green and Yellow.....	None	1,000,000	98	1,050	30,000
1740	Univ. of Pennsylvania.....	Philadelphia, Penn.....	Edgar F. Smith, LL. D.....	Non-sect.....	Red and Blue.....	150-200	8,872,500	800	4,900	30,000
1887	Univ. of Pittsburgh.....	Pittsburg, Pa.....	P. S. McCormick, LL. C.....	Non-sect.....	Blue and Gold.....	100-150	600,000	160	1,243	12,000
1850	Univ. of Rochester.....	Rochester, N. Y.....	Russ Rhoads, LL. D.....	Non-sect.....	Dandelion Yellow.....	.....	100,000	25	402	51,000
1854	Univ. of St. Mary.....	Galveston, Tex.....	Rev. A. E. Otis, S. J.....	R. Catholic.....	Gold.....	40	150,000	11	105	8,500
1880	Univ. of S. California.....	Los Angeles, Cal.....	G. F. Howard, D. D.....	Meth. Epis.....	Garnet and Black.....	40	500,000	31	320	40,000
1801	Univ. of South Carolina.....	Columbia, S. C.....	S. C. Mitchell, LL. D.....	State.....	Vermilion.....	12	1,360,000	50	454	15,000
1882	Univ. of South Dakota.....	Vermillion, S. D.....	Franklin B. Gault.....	State.....	Orange and White.....	.....	1,189,201	115	973	26,000
1794	Univ. of Tennessee.....	Knoxville, Tenn.....	Brooks Ayres, Ph. D., LL. D.....	State.....	Orange and White.....	None	3,030,000	88	2,573	68,500
1883	Univ. of Texas.....	Austin, Tex.....	S. E. Messes, Ph. D.....	State.....	Purple and Old Gold.....	None	310,000	32	350	10,000
1851	Univ. of the Pacific.....	San Jose, Cal.....	Wm. Guth, Ph. D.....	Methodist.....	Purple and Old Gold.....	100	850,000	36	470	30,000
1851	Univ. of the South.....	Swansea, Tenn.....	.....	Prot. Epis.....	Crimson and a.....	10-25	856,365	67	812	30,000
1850	Univ. of Utah.....	Salt Lake City, Utah.....	Joseph T. Kingsbury, Ph. D.....	State.....	Orange and Dark Blue.....	100	1,738,520	80	657	76,412
1791	Univ. of Vermont.....	Burlington, Vt.....	Gay F. Benton, LL. D.....	State.....	Pink and Gold.....	75	650,000	20	350	15,000
1819	Univ. of Virginia.....	Charlottesville, Va.....	E. A. Alderman, D. C. LL.....	State.....	Dark Blue.....	.....	3,000,000	94	775	70,000
1861	Univ. of Washington.....	Seattle, Wash.....	T. F. Kane, Ph. D.....	State.....	Purple and Gold.....	None	5,506,318	113	2,156	42,114
1848	Univ. of Wisconsin.....	Madison, Wis.....	C. R. Van Hise, LL. D.....	State.....	Cardinal.....	5,341,149	397	4,321	44,980	
1868	Univ. of Wooster.....	Wooster, O.....	L. E. Holden, LL. D.....	Presbyterian.....	Black and Old Gold.....	60	1,579,000	31	675	30,000
1886	Univ. of Wyoming.....	Laramie, Wyo.....	Chas. O. Merica, LL. D.....	State.....	Brown and Gold.....	None	1,000,000	40	250	26,000
1857	Upper Iowa University.....	Fayette, Ia.....	Richard W. Cooper, Litt. D.....	Methodist.....	Pearce Blue and White.....	45	398,600	16	455	13,300
1850	Urbana University.....	Urbana, O.....	P. H. Reymour, Dean.....	New Church.....	Black.....	45	180,000	7	40	6,000
1869	Urbana College.....	Collegeville, Penn.....	Rev. A. E. Keagley, D. D.....	Reformed.....	Black.....	50	402,000	23	235	14,000
1872	Vanderbilt University.....	Nashville, Tenn.....	J. H. Kirkland, LL. D., D. C. LL.....	Methodist.....	Black and Gold.....	100	2,548,906	124	961	34,000
1842	Villanova College.....	Villanova, Penn.....	Rev. L. A. Delurey, O. S. B.....	R. Catholic.....	.....	.....	.....	.....	.....	.....
1842	Virginia Military Inst.....	Lexington, Va.....	Edward W. Nichols, LL. D.....	State.....	.....	75	650,000	30	350	12,000
1882	Walsh College.....	Crawfordsville, Ind.....	George L. Mackintosh.....	.....	.....	47	1,100,000	22	350	43,000
1888	Wake Forest College.....	Wake Forest, N. C.....	William L. Fostat, LL. D.....	Baptist.....	Old Gold and Black.....	50	512,794	32	387	19,000
1866	Walden University.....	Nashville, Tenn.....	Rev. J. A. Kummer, D. D.....	Methodist.....	Black and Red.....	12-50	160,000	71	843	7,000
1868	Warburg College.....	Clinton, Ia.....	John Fritschel.....	Lutheran.....	.....	.....	95,000	7	82	3,000
1868	Washington College.....	Collegeville, Minn.....	Rev. J. D. Kneass, D. D.....	Congregational.....	Yale Blue.....	50-65	100,000	101	105	.....
1782	Washington College.....	Chesapeake, Md.....	James W. Cain, LL. D.....	Non-sect.....	.....	50	125,000	12	151	3,500
1795	Washington College.....	Washington Coll., Tenn.....	James T. Coates, D. D.....	Presbyterian.....	.....	.....	115,000	9	135	4,700
1802	Wash'g'n and Jefferson.....	Washington, Penn.....	Rev. J. D. Moffat, LL. D.....	Presbyterian.....	.....	60	1,016,475	30	425	20,000
1749	Washington and Lee U.....	Lexington, Va.....	G. H. Denney, LL. D.....	Non-sect.....	Blue and White.....	50	1,400,000	38	600	52,000
1853	Washington University.....	St. Louis, Mo.....	D. F. Houston, LL. D.....	Non-sect.....	Myrtle and Maroon.....	100-150	10,299,425	142	1,043	76,500
1831	Wesleyan University.....	Middletown, Conn.....	Wm. A. Shanklin, LL. D.....	Methodist.....	Cardinal and Black.....	85	2,661,000	43	340	52,000
1867	Western Maryland Coll.....	Westminster, Md.....	T. H. Lewis, D. D.....	Methodist.....	Black.....	45	350,000	21	290	10,000
1826	Western Reserve Univ.....	Cleveland, O.....	Charles F. Thwing, LL. D.....	Non-sect.....	Crimson and White.....	100	4,000,000	198	1,083	90,500
1865	Westfield College.....	Westfield, Ill.....	B. F. Daugherty, D. D.....	Un. Brethren.....	White.....	60	400,000	198	1,083	90,500
1853	Westminster College.....	Fulton, Mo.....	D. R. Kerr, D. D.....	Presbyterian.....	Yale Blue.....	100	403,239	14	145	3,500
1852	Westminster College.....	N. Wilmington, Penn.....	R. M. Russell, D. D., LL. D.....	Un. Presb.....	.....	60	440,000	24	316	8,000
1867	West Virginia Univ.....	Morgantown, W. Va.....	D. B. Burnell, LL. D.....	State.....	Old Gold and Blue.....	25-50	1,165,000	70	1,338	40,000
1890	W. Va. Wesleyan.....	Buckhannon, W. Va.....	C. G. Doney, D. D.....	Methodist.....	.....	50	295,000	23	270	6,000
1860	Wheaton College.....	Wheaton, Ill.....	C. A. Blackhead, D. D.....	Non-sect.....	.....	50	300,000	25	250	4,000
1859	Whitman College.....	Lula, Walla, Wash.....	S. B. L. Penrose, D. D.....	Non-sect.....	Cobalt Blue and Maroon.....	109	865,000	27	240	16,400
1856	Wilberforce University.....	Wilberforce, O.....	W. S. Scarborough, LL. D.....	African M. E.....	Green and Old Gold.....	100	300,000	30	400	6,000
1873	Wiley University.....	Marshall, Tex.....	W. M. Dugan, Ph. D.....	Methodist.....	.....	12	100,000	35	670	38,000
1844	Williamette University.....	Liberty, Ore.....	Frederic H. Homan, D. D.....	Methodist.....	Cardinal and Old Gold.....	60	460,000	45	300	5,000
1693	William and Mary Col.....	Williamsburg, Va.....	H. G. Tyler, LL. D.....	State.....	.....	35	400,000	21	250	20,000
1849	William Jewell College.....	Liberty, Mo.....	J. P. Greene, LL. D.....	Baptist.....	.....	50	750,000	40	600	20,000
1793	Williams College.....	Williamstown, Mass.....	L. A. Garfield, LL. D.....	Non-sect.....	Royal Purple.....	140	2,904,743	59	541	66,000
1875	Williamson College.....	Wilmington, O.....	A. J. Brown, M. A., D. D.....	Friends.....	.....	50	225,000	14	150	4,000
1882	Wittenberg College.....	Albion, La. Minn.....	Charles G. Hecker, D. D.....	Lutheran.....	.....	60	750,000	80	700	18,000
1854	Wofford College.....	Spartanburg, S. C.....	Henry N. Snyder, M. A.....	Methodist.....	.....	40	468,000	13	269	18,000
1701	Yale University.....	New Haven, Conn.....	A. T. Hadley, LL. D.....	Non-sect.....	Blue.....	150pp	15,500,000	401	3,275	575,000
1862	Yankton College.....	Yankton, S. D.....	Rev. H. K. Warren, LL. D.....	Congregational.....	White.....	40	367,494	25	342	7,000
1890	York College.....	York, Neb.....	W. E. Schell, D. D.....	Un. Brethren.....	White.....	34-50	150,000	17	504	2,200

## Colleges for Women in the United States

FOUNDED	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DENOMINATION	COLORS	COST OF TUITION	VALUE OF PROPERTY	NUMBER OF INSTRUCTORS	NUMBER OF STUDENTS	VOLUMES IN LIBRARY
1854	Alabama Coll. Fem.....	Tuskegee, Ala.....	John Massey, LL. D.....	.....	.....	.....	\$ 357,000	17	146	4,000
1903	Alabama Synodical Col.....	Talladega, Ala.....	Rev. T. F. Walton.....	Presbyterian.....	.....	.....	20,000	9	255	10,000
1882	Albert Lea College.....	Albert Lea, Minn.....	Ann B. Kierulff, M. A.....	Presbyterian.....	.....	.....	225,000	15	225	15,000
1867	Allegheny College.....	Allegheny, Penn.....	Rev. W. F. Curtis.....	Reformed.....	.....	.....	75,000	19	173	18,000
1854	Andrew Female College.....	Cuthbert, Ga.....	Rev. J. W. Malone, D. D.....	Methodist.....	.....	.....	100,000	12	150	4,000
1889	Barnard College.....	New York.....	W. T. Brewster, M. A.....	Non-sect.....	Light Blue and White.....	\$ 150	3,000,000	66	729	5,000
1845	Baylor Female College.....	Belton, Tex.....	W. A. Wilson, D. D.....	Baptist.....	Green and Gold.....	.....	175,000	20	402	6,000
1841	Beaumont College.....	Harrodsburg, Ky.....	Thomas Smith, M. A.....	Non-sect.....	.....	.....	50,000	10	95	4,000

## Colleges for Women in the United States—Continued

FOUNDED	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DENOMINATIONAL CONTROL	COLORS	COST OF TUITION	VALUE OF PROPERTY (including Endowment)	NUMBER OF INSTRUCTORS	NUMBER OF STUDENTS	VOLUMES IN LIBRARY	
1853	Beaver College	Beaver, Penn.	W. W. Foster, Jr., D. D.	Methodist			\$150,000	16	216	3,000	
1894	Bethany College	Jackson, Miss.	James R. Preston	Non-sect.			50,000	12	127	2,500	
1894	Bessie Titt College	Enryville, La.	C. C. Jackson, L. L. D.	Baptist			204,000	13	269	2,500	
1854	Bethel Female College	Hopkinsville, Ky.	H. G. Brownell, M. A.	Baptist			50,000	7	100	3,000	
1851	Bethlehem College	Hamlet, Pa.	Magnum C. Brown	Presbyterian			75,000	10	75	1,000	
1851	Bine Mountaine Female	Blue Mountain, Miss.	B. C. Lowry, M. A.	Non-sect.			60,000	12	125	500	
1858	Boscobel College	Nashville, Tenn.	Mrs. J. O'Brien Rust	Baptist			200,000	381	3,500		
1878	Brenau College	Savannah, Ga.	Haywood J. Pearce	Non-sect.			1,014,889	44	429	8,000	
1854	Bryn Mawr College	Bryn Mawr, Penn.	M. Carey Thomas, L.L.D.	Presbyterian	Yellow and White	125-200	87,000	22	265	3,000	
1854	Caldwell College	Danville, Ky.	John Carey Jackson, M. A.	Baptist			75,000	11	140	3,000	
1892	Central Baptist College	Conway, Ark.	W. W. Rivers, M. A.	Baptist			200,000	10	143	7,000	
1851	Central Female College	Lester, Mo.	G. M. Gibson	M. E. South.			20,000	7	41	800	
1851	Chapell Hill Female	Chapell Hill, Tex.	James E. Willis	M. E. South.			50,000	8	125	1,000	
1854	Chickasaw Female Col.	Pontotoc, Miss.	Katherine E. Crawford	Presbyterian			25,000	10	150	1,200	
1851	Christian College	Columbia, Mo.	Mrs. W. T. Moore	Christian			25,000	10	207		
1851	Clifford Female College	Union, S. C.	R. G. Clifford, D. D.	Non-sect.			75	331	10	354	
1854	Columbia Female Col.	Columbia, S. C.	Rev. W. W. Daniel, D. D.	M. E. South.			100,000	20	200	2,000	
1890	Converse College	Spartanburg, S. C.	Robert P. Pell, Litt. D.	Non-sect.			200,000	12	145	1,200	
1854	Cotley College	Nevada, Mo.	Mrs. V. A. C. Stockard	Non-sect.			60,000	23	354	8,500	
1851	Cox College	College Park, Ga.	John W. Gaines	Non-sect.			200,000	27	200	5,000	
1859	Due West Female Col.	Due West, S. C.	Rev. R. L. Holins	A. R. Presb.			260,000	20	170	1,300	
1897	Elizabeth College	Charlotte, N. C.	Rev. C. B. King, D. D.	Non-sect.			200,000	20	170	1,300	
1855	Elmira College	Elmira, N. Y.	Rev. A. C. MacKenzie, D.D.	Presbyterian			200,000	20	170	1,300	
1895	Florida State College for Women	Tallahassee, Fla.	Edward Conrad, M. A.	Non-sect.			200,000	23	257	7,000	
1879	Gaston College	Dallas, N. C.	R. A. Wolff, A. M.	Lutheran			10,000	12	149	1,500	
1854	Glendale College	Glendale, O.	Mrs. R. J. De Vore, M. A.	Non-sect.			50,000	12	70	3,000	
1858	Greenboro Female Col.	Greenboro, N. C.	Mrs. L. H. Robertson	M. E. South.			300,000	18	203	2,000	
1851	Hardin College	Lexington, Mo.	W. M. Milson, M. A.	Baptist			200,000	22	200	2,500	
1852	Hillman College	Clinton, Miss.	W. J. Lowrey, D. D.	Non-sect.			15,000	10	150	1,200	
1851	Hollins Institute	Hollins, Va.	Mrs. Matty L. Cooke	Non-sect.			200,000	36	250	4,000	
1851	Howard Female College	Mechanicville, Penn.	M. A. Ingram, M. A.	Non-sect.			100,000	16	203	1,800	
1859	Howard-Payne College	Fayette, Mo.	Rev. H. E. Stout	M. E. South.			50	100,000	16	203	
1847	Hillman Woman's Col.	Jacksonville, Ill.	Rev. J. R. Harker, Ph. D.	Methodist			350,000	36	350	1,200	
1851	Irring College	Irvington, N. Y.	E. E. Campbell, Ph. D.	Lutheran			100,000	18	150	1,200	
1852	Isabel College	Taladega, Ala.	Frank B. Webb, D. D.	Presbyterian			10,000	6	75	200	
1851	Jessamine Institute	Nicholasville, Ky.	Mrs. J. B. Stearns	Non-sect.			75,000	7	75	2,000	
1854	Lee Maw College	Lee Maw, Ky.	Rev. S. M. Newman	Lutheran			70,000	12	100	1,000	
1846	La Grange Female Col.	La Grange, Ga.	G. W. Smith, M. A.	M. E. South.			190,000	22	199	2,600	
1851	Lake Erie College	Painesville, O.	Vivian Blanche Small	Non-sect.			125	500,000	25	170	1,400
1851	Lander College	Greenville, S. C.	Rev. J. O. Wilson, D. D.	M. E. South.			88-50	77,000	17	187	8,000
1851	Lasell Seminary	Auburndale, Mass.	G. M. Winslow, Ph. D.	Non-sect.			205,000	31	192	2,300	
1851	Lexington College	Lexington, Mo.	E. W. White, M. A.	Non-sect.			20,000	14	140	1,500	
1851	Liberty College	Liberty, Mo.	Rev. C. W. Smith, Ph. D.	Baptist			70,000	10	100	2,500	
1845	Limestone College	Gaffney, S. C.	L. D. Lodge, Ph. D.	Baptist			150,000	15	201	4,700	
1851	Lindenwood College	St. Charles, Mo.	Rev. G. F. Ayers, Ph. D.	Presbyterian			190,000	15	126	1,500	
1851	Louisiana Female College	Louisville, Ky.	E. D. Atkins	M. E. South.			10,000	10	100	2,500	
1856	Louisiana Female Col.	Louisburg, N. C.	Mrs. Ivey Allen	Methodist			20,000	13	103	900	
1856	Louisiana Female Col.	Kenilworth, N. C.	G. W. Thigpen, M. A.	Baptist			25,000	4	40	1,000	
1851	Lucy Cobb Institute	Kent's Hill, Me.	Rev. C. W. Smith, M. A.	Methodist			350,000	14	200	9,000	
1854	Maine Wesleyan College	Mansfield, La.	T. S. Nigh, M. A.	M. E. South.			50,000	10	109	2,000	
1851	Marion Female College	Marion, Va.	Rev. J. J. Scherer, D. D.	Lutheran			20,000	12	120	2,000	
1854	Marion Female College	Abingdon, Va.	Rev. S. D. Long, D. D.	M. E. South.			84,000	17	180	2,000	
1853	Marion College	Abingdon, Va.	Rev. J. M. Hark, D. D.	M. E. South.			80,000	14	160	600	
1853	Maryland for Women	Lutherville, Md.	C. W. Gallagher, D. D.	Non-sect.			150,000	17	119	6,000	
1842	Memphis Con. F. Ins	Jackson, Tenn.	Rev. A. B. Jones, L.L.D.	M. E. South.			60,000	17	210	5,000	
1853	Millsburg Female Col.	Millsburg, Ky.	Rev. C. C. Fisher, M. A.	M. E. South.			61,000	14	160	250	
1901	Milwaukee-Duane Col.	Milwaukee, Wis.	Mrs. E. C. Smith, M. A.	Non-sect.			622,576	36	443	8,400	
1854	Moranville Seminary	Bethlehem, Penn.	Henry L. Whitfield	State			500,000	69	760	8,000	
1851	Mount Holyoke College	South Hadley, Mass.	Mrs. M. E. Woolley, L.L.D.	Non-sect.	Light Blue	150	1,870,000	83	761	11,000	
1857	Newcomb Memorial C.	New Orleans, La.	B. V. B. Dixon, L.L.D.	Non-sect.			3,000,000	30	318	7,000	
1857	Notre Dame College	San Jose, Cal.	Sister Mary Bernadine	R. Catholic			240,000	30	118	7,800	
1850	Ogonts School for Girls	Ogonts, Penn.	Mrs. S. J. Eastman	Non-sect.			20,000	32	142	1,000	
1891	Owensboro Female Col.	Owensboro, Ky.	J. Dyrona L. Rue	Non-sect.			30,000	15	205	2,000	
1851	Oxford College	Oxford, O.	John Sherrard, Ph. D.	Non-sect.			150,000	19	139	1,000	
1854	Packer Coll. Institute	Brooklyn, N. Y.	E. J. Goodwin, L. H. D.	Non-sect.			400,000	65	700	8,500	
1899	Pittsburg College	Pittsburg, Penn.	Rev. H. O. Lindsay, D. D.	Non-sect.			650,000	17	95	3,000	
1851	Putnam College	Putnam, Conn.	Rev. J. F. Cadell, D. D.	Non-sect.			20,000	10	100	2,000	
1851	Radcliffe College	Cambridge, Mass.	L. B. R. Briggs, L.L.D.	Non-sect.	Crimson and d White	200	1,400,000	119	459	23,000	
1893	Randolph-Macon Col.	Lynchburg, Va.	W. W. Smith, L.L.D.	M. E. South.			700,000	40	483	9,000	
1859	Roosevelt Female Col.	Danville, Va.	J. B. Brewer, Ph. D.	Baptist			50	20,000	11	91	2,500
1849	Rockford College	Rockford, Ill.	Rev. C. D. Sullivan, Ph. D.	Non-sect.			245,000	15	160	2,500	
1859	St. Elizabeth College	Convent Station, N.J.	Sister Mary Pauline	R. Catholic			300,000	25	372	2,000	
1898	St. Mary's School	Knoxville, Ill.	Rev. C. W. Leffingwell, D.D.	Prot. Epis.			200,000	20	100	10,000	
1898	St. Mary's School and Col.	St. Mary, N. C.	Rev. H. H. Smith, Ph. D.	Prot. Epis.			270,000	17	160	2,500	
1854	San Antonio Female Col.	San Antonio, Tex.	Rev. J. E. Harrison	Non-sect.			125,000	15	217	3,000	
1845	Sayre Female Institute	Lexington, Ky.	J. Morton Spencer, D. D.	Presbyterian			150,000	13	110	290	
1851	Shenandoah College	Shenandoah, Va.	Rev. J. M. Hark, D. D.	Baptist			70	200,000	5	5,000	
1851	Silliman College Inst.	Clinton, La.	H. H. Browne	Presbyterian			75,000	8	89	1,000	
1899	Simmons College	Boston, Mass.	Henry Leavell, L.L.D.	Non-sect.	Blue and Gold	100	2,875,422	76	670	10,500	
1867	Sisters of the Holy Col.	San Jose, Cal.	Sister Mary Bernadine	R. Catholic			240,000	30	118	7,800	
1875	Smith College	Northampton, Mass.	Rev. M. L. Horton, Ph. D.	Non-sect.	White	100	2,965,606	118	1,609	30,000	
1852	Soule College	Murfreesboro, Tenn.	Mrs. M. A. Hopkins	Non-sect.			17,500	14	130	1,200	
1851	Stanton College	Natchez, Miss.	Rev. C. W. Leffingwell, D.D.	Non-sect.			100,000	15	160	2,500	
1898	Stewart Jackson Col.	Abingdon, Va.	Mrs. M. M. Hunt-Davis	Presbyterian			50,000	15	103		
1853	Stuart Hall College	Staunton, Va.	Mrs. M. P. Duval	Prot. Epis.			75,000	25	125	1,500	
1851	Sullivan College	Fulton, Mo.	Rev. C. W. Leffingwell, D.D.	Non-sect.			200,000	12	100	600	
1871	Synodical Female Col.	Franklin, Tenn.	T. F. Allen	Non-sect.			70,000	14	160	2,000	
1854	Tennessee Female Col.	Franklin, Tenn.	Rev. C. W. Leffingwell, D.D.	Non-sect.			70,000	14	160	2,000	
1858	Texas Female College	Tuscaloosa, Ala.	R. J. Holton, M. A.	Non-sect.			50,000	8	100	1,000	
1861	Vassar College	Poughkeepsie, N. Y.	J. M. Taylor, L.L.D.	Non-sect.	Rose and Gray	150	4,135,000	101	1,040	66,000	
1851	Verginia Institute	Nashville, Tenn.	Rev. C. W. Leffingwell, D.D.	Non-sect.			200,000	32	500	4,000	
1865	West Seminary	Nashville, Tenn.	J. M. Taylor, L.L.D.	Non-sect.	Deep Blue	175	3,089,807	103	1,319	66,200	
1876	Wellesley College	Wellesley, Mass.	Ellen F. Pendleton, M. A.	Non-sect.			750	4,000,000	29	460	3,500
1851	Wells College	Wells, N. Y.	W. N. Ainsworth	Methodist B.	Cardinal and Black	70	400,000	29	460	3,500	



## Colleges for Women in the United States—Continued

FOUNDED	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DENOMINATIONAL CONTROL	COLORS	COST OF TOWNS	VALUE OF FACILITIES (Including Endowment)	NUMBER OF INSTRUCTORS	NUMBER OF STUDENTS	VOLUMES IN LIBRARY
1831	Westbrook College	Portland, Me.	Arthur C. Yeaton	Universalist	.....	.....	\$250,000	9	100	3,000
1855	Wentworth College	Orford, O.	Rev. J. G. Newman, D. D.	Non-sect.	.....	\$100	700,000	35	220	15,000
1859	Whitworth Female Col.	Brookhaven, Ga.	Rev. I. W. Cooper, D. D.	Methodist Soc.	.....	.....	125,000	16	242	3,000
1908	William Smith College	Genava, N. Y.	L. C. Stearns, L. L. D.	Non-sect.	.....	.....	.....	22	34	46,387
1870	Wilson College	Chambersburg, Penn.	M. H. Reaser, Ph. D.	Non-sect.	.....	60	404,532	33	340	7,000
1862	Woman's College	Frederick, Md.	R. H. Apple, M. A.	Non-sect.	.....	.....	.....	18	303	4,000
1868	Woman's of Baltimore	Baltimore, Md.	E. A. Noble, D. D.	Methodist	Dark Blue and Gold	150	1,440,000	27	356	55,000
1869	Young's Female Col.	Thomasville, Ga.	J. E. Pearce, Ph. D.	Presbyterian	.....	.....	7,500	13	72	.....

## Schools of Technology in the United States

FOUNDED	NAME OF INSTITUTION	LOCATION	PRESIDENT OR DEAN	DENOMINATIONAL CONTROL	COLORS	COST OF TOWNS	VALUE OF FACILITIES (Including Endowment)	NUMBER OF INSTRUCTORS	NUMBER OF STUDENTS	VOLUMES IN LIBRARY
1890	Agricultural of Utah	Logan, Utah	J. A. Wideson, Ph. D.	State	.....	.....	\$406,611	15	532	16,900
1893	Ag. and Mech. (Color.)	Oreanboro, N. C.	J. B. Dudley, M. A.	State	.....	None	135,000	15	179	1,500
1872	Alabama Poly. Institute	Anniston, Ala.	Levi J. Rowan, M. Sc.	State	Orange and Gold	.....	789,486	67	732	33,000
1871	Alcorn Ag. and Mech.	Chickasaw, Miss.	W. W. Waters, D. D.	State	Yellow and Black	.....	250,000	22	503	2,700
1862	Armour Inst. of Tech.	Chicago, Ill.	C. C. Thack, L. L. D.	Non-sect.	.....	.....	.....	.....	.....	.....
1861	Case School of Ag. Sci.	Cleveland, O.	C. S. Howe, Ph. D.	Non-sect.	Brown and White	.....	3,000,000	37	479	8,000
1896	Clarkson Sch. of Tech.	Potomac, N. Y.	W. S. Aldrich, M. E.	Non-sect.	.....	100	472,221	9	62	3,700
1869	Clemson Agricultural	Clemson Coll., S. C.	Walter M. Riggs, B. Sc.	Non-sect.	Purple and Orange	.....	4,185,201	47	634	29,000
1879	Colorado Agricultural	Fort Collins, Colo.	Charles A. Lowry, M. Sc.	State	.....	None	600,000	75	221	78,000
1874	Colorado Sch. of Mines	Golden, Colo.	V. C. Aldison, Director	State	.....	150	650,000	20	358	10,000
1881	Connecticut Agric. Col.	Storrs, Conn.	C. H. Beach, M. Sc.	State	.....	.....	360,000	25	300	10,750
1884	Georgia Sch. of Tech.	Atlanta, Ga.	K. G. Matheson, L. L. D.	State	.....	.....	600,000	42	362	0
1869	Iowa S. of Ag. and M. A.	Ames, Ia.	Henry J. Waters, B. Sc.	State	.....	.....	2,979,646	171	1,238	27,000
1863	Kansas State Agric. Col.	Manhattan, Kan.	J. K. Patterson, L. L. D.	State	.....	.....	1,815,331	148	2,308	35,000
1862	Kentucky Ag. and M.	Lexington, Ky.	R. W. Silver, L. L. D.	State	.....	.....	468,485	60	681	7,100
1864	Maryland Agricultural	College Park, Md.	J. W. Butterfield, M. A.	State	.....	.....	785,000	40	385	3,000
1863	Massachusetts Agric. Col.	Amherst, Mass.	H. C. McLaughlin, L. L. D.	Non-sect.	Cardinal Red and Silver Gray	.....	4,000,000	154	1,478	78,000
1861	Mass. Inst. of Tech.	Boston, Mass.	.....	.....	.....	.....	700,000	30	245	22,500
1885	Michigan Col. of Mines	Houghton, Mich.	Fred W. McNair, D. Sc.	State	.....	25	1,034,127	113	1,403	81,000
1857	Michigan State Agric.	Lansing, Mich.	J. L. Snyder, Ph. D.	State	Green	.....	1,523,861	26	256	4,000
1880	Miller Manual College	Starkville, Miss.	J. C. Hardy, L. L. D.	City	Maroon and White	.....	855,299	49	650	13,250
1893	Missouri Agricultural	Boonville, Mo.	J. M. Hamilton, M. Sc.	State	.....	30-50	1,189,483	35	348	5,500
1900	Montana S. of Mines	Butte, Mont.	Chas. H. Bowman	State	.....	.....	506,825	47	447	7,850
1895	N. C. of A. and M.	West Raleigh, N. C.	D. H. Hill, Litt. D.	State	.....	45	1,250,000	47	447	7,850
1893	Newark Tech. Sch.	Newark, N. J.	W. D. Gibbs, D. Sc.	State	.....	.....	537,266	40	303	12,300
1899	N. H. of A. and M. A.	Durham, N. H.	W. E. Garrison, Ph. D.	Territory	.....	.....	1,864,252	53	1,083	21,750
1893	N. M. of A. and M. A.	Merilla Park, N. M.	G. R. Wren, L. L. D.	State	.....	.....	80,000	14	250	5,000
1891	N. Y. State Agric. Col.	Fargo, N. D.	G. R. Wren, L. L. D.	State	.....	.....	448,000	42	403	12,000
1873	North Dakota Agric. Col.	Dahlgren, Ga.	W. J. Kerr, D. Sc.	State	Orange	None	850,281	92	1,600	7,250
1873	Ohio Ag. and M.	Columbus, Ohio	W. E. Stone, Ph. D., L. L. D.	State	Old Gold and Black	.....	2,150,000	150	1,094	30,000
1868	Oregon Agricultural Col.	Corvallis, Ore.	.....	.....	Cherry and Cardinal	.....	2,627,351	48	650	8,800
1874	Purdue University	Lafayette, Ind.	.....	.....	White	200	799,000	35	396	9,500
1824	Rensselaer Poly. Inst.	Troy, N. Y.	P. C. Ricketts, C. E.	Non-sect.	Orange and White	.....	1,400,000	21	210	12,000
1890	R. I. of A. and M. A.	Kingston, R. I.	Howard Edwards, L. L. D.	State	.....	.....	614,888	42	626	10,000
1874	Rose Polytechnic Inst.	Terre Haute, Ind.	C. Leo Mees, Ph. D.	Non-sect.	.....	100	246,001	167	1,494	20,000
1841	South Dakota Agric. Col.	Brookings, S. D.	R. L. Slagle, Ph. D.	State	.....	.....	1,800,000	35	396	9,500
1855	S. D. S. of Mines	Rapid City, S. D.	R. L. Fenton, E. M.	State	.....	.....	292,912	40	373	5,400
1871	Sitona Inst. of Tech.	Hoboken, N. J.	A. C. Humphreys, L. L. D.	Non-sect.	Silver Gray and Cardinal	.....	2,466,001	167	1,494	20,000
1876	Texas Agr. and Mech.	College Station, Tex.	R. T. Milner, L. L. D.	State	.....	None	392,912	40	373	5,400
1891	Throop Polytec. Inst.	Pasadena, Cal.	J. A. B. Scherer, L. L. D.	Non-sect.	Black and Gold	.....	20,000,000	110	533	77,000
1881	Tuskegee Institute	Tuskegee, Ala.	B. T. Washington, L. L. D.	Non-sect.	New Blue and Gold	.....	11,000,000	110	780	50,000
1862	U. S. Military Acad.	West Point, N. Y.	Major Gen. Thomas H. Barry	National	.....	.....	784,820	64	502	11,000
1845	U. S. Naval Academy	Annapolis, Md.	Gen. A. S. Superintendent	National	.....	.....	4,910,000	55	1,262	16,800
1873	Virginia Polytechnic	Blacksburg, Va.	Paul B. Barringer, L. L. D.	State	Orange and Black	.....	.....	50	515	13,900
1892	Washington Agric. Col.	Pullman, Wash.	E. A. Bryan, L. L. D.	State	.....	.....	.....	.....	.....	.....
1905	Worcester Poly. Inst.	Worcester, Mass.	E. A. Engler, L. L. D.	Non-sect.	Crimson and Steel Gray	150	.....	.....	.....	.....

## FOREIGN COLLEGES AND UNIVERSITIES

FOUNDED	LOCATION	NAME OF UNIVERSITY	STUDENTS	VOLUMES IN LIBRARY	PARVING LANGUAGE	UNDER WHAT CONTROL
1494	Aberdeen, Scotland	University of Aberdeen	1,100	180,000	English	.....
1572	Adelaide, Australia	University of Adelaide	624	120,000	English	.....
1874	Agram, Hungary	University of Agram	1,464	.....	Hungarian	State
1409	Aix-en-Provence, France	University of Aix-Marseilles	1,269	87,000	French	State
1387	Albany, India	University of Allahabad	899	.....	Ind. & Eng.	State
1632	Amsterdam, Netherlands	Universiteit van Amsterdam	1,051	600,000	Dutch	.....
1875	Amsterdam, Netherlands	Free University	170	.....	Dutch	.....
1836	Angers, France	University of Angers	229	35,000	French	Catholic
1862	Auckland, New Zealand	National University	2,536	270,000	English	State
1450	Barcelona, Spain	University of Barcelona	1,800	.....	Spanish	State
1460	Basel, Switzerland	Universitat de Barcelona	1,800	160,000	German	.....
1875	Beirut, Syria	Université St. Joseph	669	252,000	Arabic	State
1878	Belgrade, Servia	Srpska Kraljevska Velika Skola	200	100,000	Serbian	.....
1879	Berlin, Germany	Friedrich-Wilhelms Universität	1,022	60,000	German	.....
1834	Berne, Switzerland	Universität Kantons	1,844	431,900	German	State
1840	Bordeaux, France	Université de Bordeaux	9,225	25,000	French	.....
1875	Birmingham, England	University of Birmingham	1,000	.....	English	.....

## Foreign Colleges and Universities—Continued

Page	Location	Name of University	Students	Library	Prevailing Language	Under What Control
1119	Bologna, Italy	Regia Università degli Studi	2,000	300,000	Italian	
1187	Bombay, India	University of Bombay	1,121		Hindu	
1191	Bonn, Prussia	Friedrich-Wilhelms Universität	3,656	253,000	German	
1441	Bordeaux, France	Université de Bordeaux	2,406	95,000	French	
1306	Breslau, Germany	Universität	2,405	350,000	German	
1306	Breuscia, Belgium	Université Libre de Bruxelles	1,050		French	
1864	Bucharest, Roumania	Universitatea din Bucuresti	3,422	181,925	Romanian	Free.
1776	Budapest, Hungary	University of Budapest	6,835	300,000	Hungarian	State
1808	Buenos Aires, Argentina	Universidad Nacional	364	150,000	Spanish	State
1437	Caeu, France	Université de Caen	814	137,000	French	
1396	Cagliari, Italy	Regia Università degli Studi	270	95,560	Italian	
1377	Cairo, Egypt	Azhar University	2,940		Arabic-Coptic	Moslem.
1827	Calcutta, India	University of Calcutta	9,300		Hindu	
1257	Cambridge, England	University of Cambridge	4,200	400	English	
1852	Canberra, Australia	Libera Università degli Studi	1,493	550,000	Italian	
1873	Canterbury, New Zealand	University of New Zealand	809		English	State
1873	Capetown, U. S. A.	University of Capetown	400	40,000	Spanish	State
1852	Caracas, Venezuela	Universidad Nacional	1,584		Italian	
1444	Catania, Sicily	Regia Università degli Studi	1,060	209,000	Italian	
1811	Christiania, Norway	Kongelige Frederiks Universitet	1,584	90,000	French	
1808	Clermont-Ferrand, France	Université de Clermont	2,916	100,000	Portuguese	
1200	Coimbra, Portugal	Universidade de Coimbra	1,050	475,000	Danish	State
1479	Copenhagen, Denmark	University of Copenhagen	1,432	45,000	Spanish	State
1833	Cordoba, Argentina	Universidad Nacional	3,211	395,000	Polish	State
1394	Cracow, Austria	Franc-Joseph Universität	1,051	175,000	Polish	State
1873	Cracow, Austria	Université de Dijon	996	56,000	French	
1722	Dijon, France	University of Dublin	1,109	297,000	English	
1880	Dublin, Ireland	Royal University of Ireland	230		English	
1353	Durham, England	Durham University	3,826	237,000	English	
1353	Edinburgh, Scotland	University of Edinburgh	1,084	27,073	German	
1563	Edinburgh, Scotland	Friedrich-Wilhelms Universität	270	94,500	Italian	
1437	Erlangen, Germany	Libera Università di Ferrara	2,678	270,000	German	
1391	Ferrara, Italy	Badiische Albert-Ludwigs Universität	629	182,000	German	
1457	Freiburg, Germany	Universität de Genève	1,634	172,000	French	State
1359	Geneva, Switzerland	Regia Università degli Studi	1,325	187,000	Italian	
1912	Genoa, Italy	Université l'Etat de Gœttingen	1,201	309,770	German	State
1812	Ghent, Belgium	Ludwigs Universität	2,096	200,000	English	
1607	Gießen, Germany	Göteborgs Högskola	1,111		Swedish	
1451	Glasgow, Scotland	University of Glasgow	2,230	536,000	German	
1873	Göteborg, Sweden	Georg-August Universität	1,063	10,000	Spanish	
1787	Göttingen, Germany	Universidad de Granada, Spain	2,960	230,000	Spanish	State
1631	Granada, Spain	Karl-Franz Universität	1,038	189,630	German	
1811	Gratz, Austria	Universität	1,196	108,000	Polish	
1456	Greifswald, Germany	Université de Grenoble	48	140,000	Dutch	
1339	Grenoble, France	Rijks-Universiteit te Groningen	235	25,000	English	
1818	Halifax, Canada	Dalhousie University	2,003	228,000	German	
1880	Halle, Germany	Friedrichs Universität Halle Wittenberg	6,085	200,000	German	State
1880	Havana, Cuba	Universidad de la Habana	2,089	600,000	German	
1286	Heidelberg, Germany	Ruprecht-Karls Universität	2,089	200,000	Rumanian	
1640	Heidelberg, Russia	Kesjeleja Alexander Universität	1,272	215,000	Rumanian	State
1880	Leobnberg, Austria	Leopold-Franzen Universität	908	160,000	Rumanian	
1880	Jassy, Roumania	Universitatea din Jassy	1,496	370,000	German	
1358	Jassy, Germany	Sächsische Gesamt-Universität	2,100	230,000	German	
1407	Jurjev, formerly Dorpat, Russia	Imperatorskij Kazanskij Universität	2,821	247,046	Russian	
1904	Kazan, Russia	Imperatorskij Kazanskij Universität	1,450	187,000	Russian	
1904	Khar'kov, Russia	Christo-Albrechts Universität	1,353	263,000	German	
1880	Kiel, Germany	Imperatorskij Universität St. Vladimir	4,001	120,000	Russian	
1532	Kiev, Russia	University of Klausenburg	2,318	70,000	Hungarian	
1873	Klausenburg, Hungary	Albertus Universität	1,567	478,700	German	
1844	Königsberg, Germany	Teikoku Daigaku Imperial University	1,412	34,000	Japanese	
1887	Kyoto, Japan	Panjab University	6		French	State
1882	Lahore, India	Université de Lausanne	1,372	280,000	English	
1857	Lausanne, Switzerland	University of Leeds	1,229		Dutch	
1887	Leeds, England	Rijks-Universiteit	1,135	200,000	German	
1578	Leiden, Netherlands	Universität	4,916	550,000	Polish	State
1809	Leipzig, Germany	University of Francis I.	4,704	192,000	French	State
1784	Lemberg, Austria	Université de Liège	2,368		French	Catholic
1817	Liege, Belgium	Facultes Catholiques	600		French	
1878	Lille, France	Université de Lille	1,560	186,500	Spanish	
1809	Lima, Peru	Universidad de San Marcos	1,188		English	
1351	Liverpool, England	University of Liverpool	6,341	70,000	English	
1836	London, England	University of London	2,173	200,000	Swedish	Free.
1479	Lozain, Belgium	Université Catholique	967	200,000	French	
1606	Lund, Sweden	Kungl. Caroliska Universität	2,783	200,000	French	
1808	Lyons, France	Université de Lyon	600		Italian	
1875	Lyons, France	Facultes Catholiques	432		Hindu	
1540	Macarata, Italy	Regia Università degli Studi	1,528	204,000	Spanish	
1857	Madras, India	Universidad Central de España	1,258	233,000	English	
1851	Madrid, Spain	Victoria University of Manchester	1,738	204,000	Spanish-Cath.	
1851	Manchester, England	Universidad de Santo Tomas	1,200	370,000	French	
1905	Manila, P. I.	Université d'Ala Marseille	1,954	416,000	Italian	
1854	Marsville, France	University of Melbourne	515	16,000	English	
1863	Melbourne, Australia	Regia Università degli Studi	881	35,000	Italian	
1863	Mexico, Mexico	Regia Università degli Studi	826	13,184	Italian	
1876	Montevideo, Uruguay	Regia Università degli Studi	426	30,278	Italian	
1880	Montpellier, France	Universidad	720	15,000	Spanish	
1753	Moscow, Russia	Université de Montpellier	1,758	210,000	Rumanian	State
1473	Munich, Germany	Imperatorskij Mo-skorskij	8,083	431,000	German	State
1873	Münster, Germany	Indwig-Maximilians	6,337	500,000	German	State
1873	Nancy, France	Université de Nancy	1,966	200,000	French	State
1873	Naples, Italy	Regia Università degli Studi	1,841	138,000	French	State
1885	Naples, Italy	Imperatorskij Novorossijskij	6,348	262,553	Italian	State
1876	Norwich, England	Universidad Literaria	1,853	200,000	Russian	State
1576	Oriedo, Spain	University of Oxford	969	40,000	Spanish	
1200	Oxford, England	Regia Università degli Studi	3,663	600,000	English	
1873	Padua, Italy	Regia Università degli Studi	1,538	200,000	Italian	
1779	Palermo, Italy	Regia Università degli Studi	1,324	216,000	Italian	
1200	Paris, France	Université de Paris	15,749	800,000	French	
1880	Paris, France	Regia Università degli Studi	1,538	200,000	Italian	
1861	Pavia, Italy	Regia Università degli Studi	1,627	290,000	French	
1868	Peking, China	Imperial University	256	56,000	Chinese	State
1880	Perugia, Italy	Regia Università degli Studi	1,233	280,000	Italian	
1343	Pim, Italy	Regia Università degli Studi	1,233	280,000	Italian	

## Foreign Colleges and Universities—Continued

Yr'd's	LOCATION	NAME OF UNIVERSITY	STUDENTS	LIBRARY	FRATILLO LANCAGE	UNDER WEAT CONTROL
1431	Poitiers, France	Université de Poitiers	962	180,000	French.	
1348	Prague, Austria	Karl-Ferdinand Universität	6,097	34,150	German.	
1308	Rennes, France	Université de Rennes	1,498	166,000	French.	
1303	Rome, Italy	Regia Università degli Studi	3,316	204,825	Italian.	
1419	Rostock, Germany	Landes Universität	722	345,000	German.	
1111	St. Andrews	University of St. Andrews	306	115,000	English.	
1819	St. Petersburg, Russia	Imperatorskij. St. Petersburg	8,090	366,840	Russian.	
1243	Salamanca, Spain	Universidad Literaria	1,200	72,000	Spanish.	
1743	Santiago, Chili	Universidad de Chili	1,620	114,000	Spanish.	State-Cath.
1504	Santiago, Spain	Regia Università degli Studi	2,138	40,000	Spanish.	
1474	Saragossa, Spain	Universidad	1,000	95,000	Spanish.	
1677	Sassari, Italy	Regia Università degli Studi	239	90,000	Italian.	
1502	Seville, Spain	Regia Università degli Studi	1,000	95,000	Spanish.	
1879	Sheffield, England	University of Sheffield	2,138	155,000	English.	
1357	Siena, Italy	Regia Università degli Studi	235	17,000	Italian.	
1888	Sophia, Bulgaria	University of Sophia	1,324	58,517	Bulgarian.	
1878	Stockholm, Sweden	Stockholms Högskola	365	58,517	Swedish.	
1567	Strasbourg, Germany	Salser Wilhelms Universität	1,995	899,000	German.	
1742	Sydney, Australia	University of Sydney	870	.....	English.	State.
1850	Tien-Tsin, China	Chinese University	.....	.....	Chinese.	State.
1868	Tokyo, Japan	Teikoku Dairaku Imperial University	5,411	358,895	Japanese	
1888	Tomsk, Siberia	Tomskij Universitet	786	200,000	Russian	
1233	Toulouse, France	Université de Toulouse	2,975	222,000	French	
1477	Tübingen, Germany	Eberhard-Karls Universität	1,760	475,000	German	
1412	Turin, Italy	Regia Università degli Studi	2,700	.....	Italian	
1477	Uppsala, Sweden	Handelshögskolan i Uppsala	1,974	327,000	Swedish	
1671	Urbino, Italy	Regia Università degli Studi	297	13,000	Italian	
1636	Utrecht, Holland	Rijks-Universiteit	975	250,000	Dutch	
1500	Valencia, Spain	Universidad Literaria	1,700	35,000	Spanish	
1246	Valadolid, Spain	Universidad Literaria	1,286	35,000	Spanish	
1845	Vienne, Austria	Universität of Vienna	9,483	710,000	German	State
1893	Wales, Great Britain	Royal University	.....	.....	English	
1869	Warsaw, Russia	Imperatorskij Varsavskij Universitet	1,400	545,205	Polish	
1402	Würzburg, Germany	Fulius Maximilians Universität	1,467	370,000	German	
1832	Zürich, Switzerland	Universität	1,474	100,000	German	State

**College Fraternities.**—The college fraternities antedate all secret societies in America except Freemasonry. They reach back to Phi Beta Kappa, founded as a secret literary society at William and Mary College, Williamsburg, Va., Dec. 5, 1776. It was a radical departure from the open or public Latin-named literary or debating clubs which formed so marked a part of American college life in the eighteenth century and during much of the nineteenth century. Its inspiration has never been satisfactory. It is claimed, but with three Greek letters for a name (*Philosophia Beta Khybernetes*) and a secret sign and grip, it became the paragon of its type of American fraternity life in the colleges. In 1831, in response to the anti-Masonry agitation, Phi Beta Kappa abandoned its secret character, and has since then spread to a large number of American collegiate institutions, where membership in it for many years has been merely an indication of high scholarship attained.

Rituals of college fraternities did not amount to much prior to 1831, when the anti-Masonic agitation had had time to exploit the subject. Beginning with the revival in general secret-society life, which came as the reverse movement of that pendulum, the Greek-letter fraternities absorbed into the fabrics of their ceremonials much that is Masonic, the David and Jonathan, the Skull and Hood, and Druidic and chivalric legends, in some instances with a skill which not infrequently betrayed the work of a master hand.

It should be noted that among the larger universities Princeton is the only one at which there are no Greek-letter fraternities. At Yale the secret-society system differs from that at almost every other like institution, with local fraternities of its own for sophomores and for seniors (the latter Skull and Bones, Scroll and Key, Wolf's Head, and the new Elhiu Club), and the three historic Greek-letter societies, Alpha Delta Phi, Psi Upsilon, and Delta Kappa Epsilon, as the junior year stepping-stones to "Bones," "Keys," Wolf's Head, and Elhiu.

A reference to catalogues of these associations reveals the names of nearly 140,000 members, living and dead, who, during the greater portion of the last 100 years, in many instances have been prominent in professional, political, or business life.

Emulation, imitation, and a natural rivalry led to the formation of succeeding Greek-letter fraternities, the better known in the general list being given in the appended table:

## General Fraternities

FRATERNITY	MEMBERSHIP	ACTIVE CHAPTERS	INACTIVE CHAPTERS	NO. HOUSES	WHERE AND WHEN FOUNDED
Alpha Chi Rho	490	11	1	11	Trinity, 1895.
Alpha Delta Phi	11,274	23	6	23	Hamilton, 1832.
Alpha Tau Omega	7,850	59	45	23	Virginia Military Institute, 1865.
Beta Theta Phi	15,698	70	20	59	Miami, 1839.
Chi Phi	5,193	18	10	30	Princeton, 1824.
Chi Psi	4,890	18	12	17	Union, 1841.
Delta Kappa Epsilon	10,000	11	11	23	Yale, 1844.
Delta Phi	3,600	11	0	11	Yale, 1827.
Delta Psi	2,500	8	0	8	College, 1847.
Delta Sigma Phi	715	8	1	4	College, City of New York, 1901.
Delta Tau Delta	9,875	32	26	12	Bethany, 1859.
Delta Upsilon	10,000	38	4	36	Williams, 1834.
Kappa Alpha (North)	1,100	10	10	10	Union, 1825.
Kappa Alpha (South)	9,280	48	10	30	Washington and Lee, 1865.
Kappa Sigma	9,037	73	17	48	University of Virginia, 1869.
Omega Psi Alpha	312	6	0	5	College, City of New York, 1901.
Phi Delta Theta	16,460	71	24	69	Miami, 1848.
Phi Gamma Delta	10,500	57	25	45	Washington and Jefferson, 1848.
Phi Kappa Psi	10,500	43	20	31	Washington and Jefferson, 1852.
Phi Kappa Sigma	3,900	26	14	20	University of Pennsylvania, 1850.
Pi Sigma Kappa	3,000	23	0	23	Massachusetts Agricultural College, 1873.
Pi Kappa Alpha	5,000	30	6	10	University of Virginia, 1868.
Psi Upsilon	11,200	22	1	21	Union, 1833.
Sigma Alpha Epsilon	12,000	71	27	54	University of Alabama, 1856.
Sigma Chi	7,280	37	18	51	Miami, 1855.
Sigma Nu	8,000	59	14	48	Virginia Military Institute, 1869.
Sigma Phi	1,425	9	2	8	Union, 1827.
Sigma Phi Epsilon	1,060	24	6	13	Richmond College, 1901.
Sigma Psi	495	7	5	3	William & Mary, 1732.
Theta Chi	500	4	0	4	Norwich University, 1856.
Theta Delta Chi	5,000	26	16	19	Union, 1848.
Theta Xi (Eng. Sci.)	960	11	0	10	Reinhardt Polytechnic Inst., 1864.
Zeta Psi	5,500	22	9	15	New York University, 1847.
Total	215,494	1,054	356	801	

## Sororities

FRATERNITY	MEMBERSHIP	ACTIVE CHAPTERS	INACTIVE CHAPTERS	NO. HOUSES	WHERE AND WHEN FOUNDED
Alpha Chi Omega	1,270	14	1	8	De Pauw University, 1885.
Alpha Omicron Pi	5,000	11	0	3	Barnard College, 1897.
Alpha Phi	1,800	14	0	3	Syracuse University, 1872.
Alpha Xi Delta	626	14	0	6	Lombard College, 1893.
Beta Sigma Omicron	600	10	6	3	Missouri State University, 1888.
Chi Omega	1,400	22	1	2	University of Arkansas, 1895.
Delta Delta Delta	2,000	26	9	9	Boston University, 1888.
Delta Gamma	2,406	19	12	12	Warren Female Institute, 1873-4.
Gamma Phi Beta	1,322	12	0	6	Syracuse University, 1874.
Kappa Alpha Theta	3,860	29	14	7	De Pauw University, 1879.
Kappa Delta	820	13	2	0	Virginia State Normal, 1897.

## Fraternities for Women—Continued

FRATERNITY	MEMBERSHIP	ACTIVE CHAPTERS	INACTIVE CHAPTERS	NO. HOUSES	WHERE AND WHEN FOUNDED
Kappa Kappa Gamma.....	6,000	32	10	16	Monmouth College, 1891.
Pi Mu.....	1,302	10	0	1	Wesleyan College, 1852.
Pi Beta Phi.....	5,900	38	10	20	Monmouth College, 1867.
Sigma Kappa Sigma.....	1,004	3	3	3	University of Georgia, 1891.
Sigma Sigma Sigma.....	350	5	2	0	Virginia State Normal, 1898.
Zeta Tau Alpha.....	400	7	4	2	Virginia State Normal, 1898.
Total.....	30,456	285	58	108	

## Medical Fraternities

Alpha Kappa Kappa.....	3,000	34	0	0	Dartmouth, 1888.
Alpha Mu Pi Omega.....	1,000	6	1	3	University of Pennsylvania, 1891.
Alpha Sigma.....	1,150	10	0	8	New York Hom. Med. College, 1893.
Chi Zeta Chi.....	984	19	4	7	University of Georgia, 1903.
Delta Mu.....	650	10	4	7	University of Vermont, 1884.
Kappa Phi.....	1,300	22	6	4	Cheshire Military Academy, 1879.
Nu Sigma Nu.....	3,800	30	1	18	University of Michigan, 1882.
Omega Upsilon Phi.....	1,450	17	3	11	University of Buffalo, 1895.
Pi Alpha Gamma.....	2,400	13	1	7	New York Hom. Med. College, 1894.
Pi Alpha Sigma.....	800	5	0	4	Bellevue Medical College, 1906.
Pi Beta Phi.....	3,000	29	2	.....	Western University of Pennsylvania, 1891.
Pi Chi.....	3,270	34	0	10	Louisville Medical College, 1894.
Pi Delta Chi.....	2,500	12	3	7	University of Michigan, 1883.
Pi Rho Sigma.....	2,500	22	1	14	Northwestern University Medical School, 1891.
Pi Theta Chi.....	200	1	0	1	Tufts College Medical School, 1906.
Pi Mu.....	600	7	0	2	University of Virginia, 1893.
Zeta Beta Tau.....	400	11	3	4	College, City of New York, 1906.
Zeta Omicron.....	83	1	0	1	University of California, 1896.
Total.....	29,087	273	25	101	

## Legal Fraternities.

Alpha Kappa Phi.....	750	7	.....	3	University of Mississippi, 1888.
Delta Chi.....	3,110	21	4	16	Cornell University, 1890.
Gamma Eta Gamma.....	600	5	0	4	University of Maine, Law School, 1901.
Pi Alpha Delta.....	1,600	20	0	15	Northwestern University, with Law School, 1890.
Pi Delta Phi.....	8,950	42	0	16	University of Michigan, 1869.
Sigma Nu Phi.....	345	1	2	1	Law Department N. U. of Michigan, 1902.
Theta Lambda Phi.....	1,500	9	0	5	Dickinson School of Law, 1901.
Total.....	16,755	105	6	60	

**Commencement** denotes, in the United States, the occasion on which degrees are conferred by colleges and universities upon their graduates. This takes place in June or July, and closes the scholastic year, so that the name in this respect appears to be a misnomer. The exercises connected with the commencement sometimes begin on Sunday with a commencement sermon to the graduating class. On the two or three following days, the literary societies among the students hold their annual meetings, and exercises are delivered before the societies and before the alumni association. A general reunion of the alumni of previous years is held, and, frequently, also the graduates of a particular class hold, by appointment, a special reunion. The board of trustees also holds its annual meeting, receives the report of the president of the institution for the past year, and makes the necessary regulations for the year ensuing. All these transactions precede "commencement day," on which the president of the institution, in the presence of the board of trustees, the faculty, and as many friends and visitors as the occasion may bring together, confers upon the graduates the degrees for which their special studies and examinations have prepared them. The conferring of the degrees is preceded by orations delivered by the members of the graduating class, the "valedictory" and "salutatory" addresses being assigned to the scholars holding the highest rank in the class. The Latin language is frequently used by the "salutatory" speaker, as well as by the president in conferring the degrees.

**Convent Schools.**—Convent school education is based on the principle that religion should have a predominating influence in the education of the child, and that a complete retirement from the world is conducive to the formation of a Christian character. The features which distinguish them as a class from other schools consist chiefly in the peculiar methods of their management and administration.

The course of instruction presents no marked points of difference from that pursued in other schools of the same grade comprising, in England and the United States, as the prospectus of these institutions generally informs the public, "all the usual branches of a sound English education," with French, to which a greater prominence is given than in the majority of other schools. Instrumental and vocal music, and drawing are carefully attended to as necessary accomplishments; and, in many institutions, the pupils have also the "advantage of the best masters for dancing."

The superior of each of these schools is expected to exercise special care in the supervision of the department of the pupils, and the greatest possible attention is given to their religious and moral training. The religious atmosphere in which the students live, and the frequency of the devotional exercises, interwoven with the studies, are calculated to produce profound and lasting impressions.

**Cooper Union, or Cooper Institute.**—An institute founded in New York City in 1857, by Peter Cooper. Its object is to provide free schools of art and science, and free read-

ing rooms and library for the working classes. There are lecture courses, a museum, an art gallery, and a library of 31,000 volumes, with a reading room containing current numbers of nearly 50 magazines and newspapers. The institute was built at a cost of \$650,000, and was endowed by Mr. Cooper with \$300,000. It has received additional gifts from time to time from Edward Cooper and Abram S. Hewitt, and in 1899 Andrew Carnegie gave it \$300,000 for the founding of a mechanical day art school.

**Corporal Punishment,** or the infliction of physical pain as a means of discipline in the education of children, has the sanction of high authority and has been common from all times, but in recent times has fallen considerably into disrepute and disuse. Its necessity and propriety have been much discussed; and there are, probably, but few subjects in connection with practical education upon which more diverse opinions are entertained. Some contend that a resort to corporal punishment, in families and schools, is legitimate and necessary; others, that it is a "reluctant barbarism," and should never be employed, but that children can be, and always should be, governed by the use of "moral suasion," an appeal to their reason, and to their conscience, and their sense of right. Antiently, the propriety of this mode of educational coercion seems to have been scarcely questioned.

In judging of its necessity, we are to consider (1) the nature of the child to be governed, (2) the circumstances under which school or family discipline is to be carried on, and (3) the agents by whom the child is to be instructed and controlled. All sentimentalism is, of course, to be eliminated, and the facts of experience alone are to be appealed to. We must take human nature as it is, and not as we would wish it to be. We must consider the selfishness, willfulness, idleness, and spirit of mischief that must be controlled or exorcised before instruction can accomplish its purpose; and before concluding that corporal punishment is never necessary, we must be prepared to show that under all circumstances, and with all available instrumentalities, this control can be effected without any appeal to physical coercion.

As to the offenses for which corporal punishment should be inflicted, and the proper mode of inflicting it, the following suggestions (of a practical teacher) would probably meet with universal approval from those who claim that this mode of discipline is, in certain cases, indispensable: (1) It should be reserved for the baser faults. A child should never be struck for inadvertencies, for faults of forgetfulness, for irritability and carelessness, or for petty irregularities. It is a coarse remedy, and should be employed upon the coarse sins of our animal nature. (2) When employed at all, it should be administered in strong doses. The whole system of slaps, pinches, snappings, and irritating blows, is to be condemned. These petty disciplines tend to stir up anger, and excite the child to retaliate, and thus subdue it. (3) In administering physical punishment to a child, the hand should be left sacred from all violence. Pulling the hair or the ears, rapping the head with a tumbler or with the knuckles, boxing the ears, slapping the cheeks or the mouth, are all brutal expedients. These irritating and annoying practices are more likely to arouse malignant passions than to subdue them. (4) The temper with which you administer punishment will, generally, excite in the child a corresponding feeling. If you bring anger, you will be excited; if you bring affection and sorrow, you will find the child responding in sorrowful feelings; if you bring moral feelings, the child's conscience will be excited; if you bring anger, you will destroy all the benefit of punishment; love and firmness will, if anything can, work penitence and a change of conduct.

**Correspondence Schools.**—The system of instruction by correspondence is a noteworthy feature of modern education. It originated at Newham College, Cambridge, England, and, in the United States, was

inaugurated through the Chautauqua Literary and Scientific Circle in 1878.

The method which has brought the system to its present state of perfection is this: When once the subjects of work are selected by the student a number of questions are sent out bearing upon his present efficiency and future needs; a student is then called a "test-paper" is sent to sound his educational standard, and a number of directions as to the precise line of work he is to follow. A series of questions are sent out, and a course of study are sent and received periodically by instructor and pupil, the answers being duly commented upon, corrected, and returned, together with numerous hints and notes. The student is further advised as to the best books, as to special points of weakness in his work; and he learns to condense his thoughts by *continually writing out his answers*, and this latter is the keynote of all correspondence institutions. Not infrequently books are loaned, and the instructor, being generally fully acquainted with the newest and best methods of educational work, is able to afford valuable assistance to isolated students. Further, sympathy is afforded, which is a strong incentive to the solitary worker, and a ready referee is always at hand to solve difficulties and give encouragement in those times of depression too well known to solitary students.

In many correspondence classes excellent lectures are from time to time sent, and annotated books of reference, notes on syntax, grammar, and construction, quotations, problems fully worked out, which serve as examples; and students thus benefited by the research of men and women who have access to fuller sources of information than they themselves possess.

The success of the Chautauqua system led to the establishment of similar courses in various parts of the country, as adjuncts to regular residence courses, and eventually to the founding of correspondence schools devoted exclusively to this form of education, either on general or special lines. One of the chief developments of the principle is, however, as an element in university extension. Correspondence classes now form a regular part of the course in a number of educational institutions, as the University of Chicago, Armour Institute, and others. Formal courses are designed to be equivalent to corresponding residence courses and are counted in whole or part toward the degree. One of the chief institutions of the kind is the University Correspondence College, of London, England, which prepares specially for London University degrees. There are many privately conducted correspondence schools of varying degrees of merit.

**Cramming**, a term used in regard to education, to denote the fault of filling the mind with facts, without allowing it sufficient time to arrange and generalize them, to compare them with its previous acquisitions, or to determine their real significance as related to general principles. It is thus a kind of mental stuffing, and, consequently, is opposed to the true object of education, which, as the word etymologically considered implies, is not to put something into the mind, but to bring it out by appropriate exercise, its latent faculties. In college phrase, students are said to *cram* for an examination, when they make preparation with undue haste, impressing upon their memory, by repetition, a mass of things about which they expect to be questioned, but which, when the examination is over, they immediately forget. Such a process is exceedingly injurious to the mind, since it is a misdirection of its powers, wasting them at a time when they should be all steadily employed in the formation of those habits of acquisition and thought which constitute the basis of a sound intellectual character.

In elementary education, cramming is, therefore, especially pernicious; and it is at this stage that it is the most likely to occur. It may assume two forms, but chiefly the following: (1) Crowding the memory with verbal formulae—definitions, rules, statements of facts, names in geography, dates in history, etc.; (2) overtasking the

powers of the mind with a multiplicity of studies, or with such as are not adapted to its immature condition, and, therefore, cannot be comprehended; (3) undue haste in instruction, so that the pupils are compelled to commit to memory what they have had no time properly to digest in their minds.

Cramming may be the result either of the ignorance of the teacher, or of circumstances which compel him to violate the correct principles of education for some special end, as the preparation of pupils for public exhibition, in which they may make an imposing display of their superficial acquirements. Such a perversion of the teacher's work is this implies is of too frequent occurrence; for parents and patrons are too fond of witnessing such displays, and there are teachers whose eagerness for praise or patronage is sufficient to overcome their sense of the true object of their vocation. They seem to work more for their own petty ambition or pecuniary gain than for the true welfare of their pupils. The evil of this is not alone with the pupil, but is shared by the teacher himself; for by merely cramming the minds which it is his duty to educate, he fails to realize in himself the best results of giving instruction; since, while he is endeavoring to get acquaintance with the growth of his pupils' minds, he may also have the higher satisfaction of feeling the growth of his own.

**Deaf Mutes.**—The first regular instructor of the deaf and dumb was Pedro Ponce de Leon (1520-54), a Spaniard, who taught several deaf-mutes to speak, read, write, and cipher. The first extant work on the education of the deaf was written by Juan Pablo Bonet, and published in 1620.

In the instruction of the deaf and dumb there are three principal methods—the oral, the sign and manual, and the combined method.

With the oral method the deaf are instructed by and through speech. All signs except purely natural signs are discarded. The pupils are taught to pronounce the elemental sounds of the language singly and in combination, and to recognise their forms on the lips; to write, and to associate with these sounds and lip-movements the characters which represent them. As soon as the pupil can pronounce a word correctly, the scholar is taught the meaning of it. When he can say *ball*, a ball is shown to him, the connection being thus established in his mind.

To learn to articulate the sounds and combinations of the English language is a matter of some difficulty for the deaf child; to master the grammatical intricacies of our language is much more difficult. Though a bright child will learn to read and pronounce easy words in from six to twelve months, it takes eight or ten years to bring him a knowledge of the language equal to that which the average hearing child of seven or eight possesses.

Many teachers prefer the sign and manual method. Deaf-mutes are natural mimics, and, when thrown into one another's society, they grow up and learn to use many signs—at first purely mimetic, but gradually becoming conventionalized, and therefore capable of expressing abstract thought. This language of the body, or, as it is called, natural language, is often called by the deaf their mother-tongue, and most of them prefer it to acquired speech or writing as a medium for the expression of their thoughts. It must not be supposed that writing or grammar is neglected by teachers who follow this method. The language in its written form is taught from the first; finger-spelling, which is simply writing in the air, is used to save time; signs are used to explain matters which as yet cannot be explained to the pupil in words.

In schools where the combined method is adopted, speech, lip-reading, writing, finger-spelling, and signs are used in varying proportions, according to the judgment and discretion of the teacher. In 1848 A. Melville, a British writer, first introduced it at Edinburgh, introduced the method of teaching articulation by *visible speech*. The school of Great Britain began to use it in 1869, and in 1872 it was introduced into the

celebrated Clarke school at Northampton, Mass., by A. Graham Bell, son of the inventor of the telephone, comprising a series of phonetic characters based on the position of the vocal organs when in action. The characters suggest to the eye the mechanism of speech in the formation of every possible sound that can be uttered by man.

**Debating** is often employed as an exercise in schools for young men (and sometimes in those for the other sex), in order to afford a means for practice in extemporaneous speaking, and in increasing the power of investigation of subjects of scholastic or general interest. When so used, it should be carefully regulated, both as to the questions selected for discussion, and the method in which the debates are conducted. The usual rules of debate should be strictly enforced, and the participants confined to the exact subject considered, and required to use language of undoubted propriety. The rules of parliamentary debate may be made a subject of formal study auxiliary to the practice of debating, and, in this way, the students partly prepared for discussion, and the improvement in their connected with college have usually been considered a very important source of practical culture.

**Declaration**, or the formal delivery of set speeches, is another piece of culture, is of considerable importance, when conducted in a proper manner and with due regard to its special uses and limitations. The objects chiefly to be gained by exercises of this kind are the following: (1) The training and culture of the voice; (2) practice in elocution; (3) the habit of speaking in public with confidence, ease, and grace; (4) the cultivation of a taste for public speaking; (5) an improvement in the pupil's style of composition. In the education of boys and young men particularly, these are all points of great importance, inasmuch as the ability to speak effectively in public is of great value.

The following points should be carefully attended to in giving elementary instruction in declamation: (1) The piece to be declaimed should be selected with care, and the language, but in regard to the thoughts, emotions, reasoning, etc., which it may involve, and the circumstances under which it was originally spoken, as well as the character of the speaker. (2) minute, rudimentary criticism should be rendered unnecessary by sufficient preliminary training in enunciation and other departments of elocution, as well as in the use of gesture; (3) the various kinds of gestures having been taught, the pupil should be allowed great freedom in respect to their use; (4) the spirit, and not simply the form, should be thoroughly aimed at in the instruction; and no piece should be assigned to a pupil to speak which is beyond his capacity to understand and appreciate.

Even the pupils of elementary schools may be benefited by appropriate exercises in recitation and declamation; thus, the speaking of easy and interesting dialogues by two or more children will be found one of the best methods to impart to young pupils a practical acquaintance with the principles of declamation, besides cultivating a natural style of speaking.

**Dictation**, a school exercise in which the teacher reads or speaks (dictates) to the pupils what they are to write, is practised in writing, spelling, etc. Such exercises are very useful, not only to give accuracy and expertness in writing words and sentences, but to train the ear to the correct apprehension of spoken language. In this respect, it supplements copying, which exclusively disciplines the eye.

**Didactics**, the theory of instruction, as distinguished from that of education in its narrow sense, implying merely moral culture. It is commonly treated under two heads: 1. *General didactics*, which exhibits the philosophical principles of teaching, and the conditions, or *methodics*, which applies the general truths to the several branches of instruction, the different ages to be instructed, and the various individual characters and their treatment. The distinction between didactics and

pedagogy in the narrower sense is made only for the sake of separate scientific treatment, as it is universally conceded that all instruction can be rendered a means of moral education, and that no instruction deserves the name, or can be truly successful, without a corresponding development of moral power. In any branch of instruction, the teacher is being pressed into action, not on the part of the pupil, while the progress made will depend on his self-activity, and his ultimate mastery on his full appropriation of the knowledge. Power is not in the branch of art or science concerned. On the part of the teacher, moral power, engendered by such mastery, must be presupposed, if he is to impart to his pupil attention, self-activity, and love for the subject.

In regard to the age of the pupil, instruction and moral education bear to each other a changing proportion. During the first age, from earliest infancy up to the eighth or tenth year, the so-called *formal purpose* of education prevails in importance; the several functions of the youthful mind must be made self-active, and the material purpose of didactics, the acquisition of knowledge or positive learning, must be made a mere means to the former, so that the child may concentrate circles of facts be given to appropriate them as can be digested for the benefit of each function. The second age, which extends to the beginning of sexual maturity, is the one during which instruction and education should be, as it were, in equipoise; while, in the period after sexual maturity, the material purpose, that of the acquisition of knowledge and skill, may preponderate.

**Discipline** in its wider sense means the whole system of instruction to which the learner or disciple is subjected, and is thus almost interchangeable with the term "education," and "education." In its narrower sense discipline refers to the maintenance of authority. The system of school government, with its definite rules, its punishments, and its rewards, is a condition of systematic teaching, and so may be viewed as subserving the end of intellectual instruction. At the same time it is evident that authority, as the power to work through the agency of the child's will. In this way discipline comes to have a special connection with the exercise and formation of the will—in other words, with what we mark off as moral education.

The imposition of commands, by exercising the child in self-restraint and by inducing a habit of obedience, is the great means by which the early training of the will is effected, and the foundations of moral habit and good character established. The merits of any system of discipline must be tested by the measure in which it attains its ends, intellectual and moral.

The general conditions of an effective discipline are such as follow: (1) The rules laid down to be intelligible and to be uniformly enforced; (2) the rules to be as few as possible compatible with the securing of the necessary objects; (3) the avoidance of any such things as capriciousness and unfairness in the application of the rules to individual cases; (4) the recommendation of the rules laid down by first calling forth the child's feelings of respect and confidence in his ruler, and afterward, as he advances in years, gradually enlisting his intelligent approval and support. An important part of the theory of discipline concerns itself with the subject of punishments and rewards.

**Drill**, a term used to denote the strict routine of exercises required either to train pupils to the ready performance of mental or physical processes, or to impress upon their memory their arbitrary associations of facts or words which are required in many subjects of study. Thus, a certain amount of drill is required in teaching the arithmetic table, the paradigms and rules of grammar, the spelling of words, and those facts of geography that pertain to the location of places (memorizing maps). Drill requires definite exercises, and the practice in them, continued a sufficient length of time, in order to impart a kind of automatic force to the recollection. Both mind and body, by repetition, acquire definite attitudes by means of which thought and muscular

action may be accommodated to the performance of acts which at first might have seemed impossible. This is the foundation principle of drill.

**Duty** is that which we ought, or are under moral obligation, to do. The term duty thus presupposes a moral law which demands our obedience. With this abstract concept of duty, ethical writers give us a scheme of particular duties, as (1) duties to others, (2) to ourselves, (3) to God. It is evident that the child can only reach so abstract a conception as that of duty slowly, and as the result of experience and reflection. The first crude idea of duty or obligation is acquired by help of positive commands laid down and enforced by others, or by the authority of authority. *Oughtness* at first means what some one in authority bids me do. As with a community so with a child, the sphere of duty is largely determined by custom. What the child is accustomed to do and to see others do, that tends to become a matter of duty or obligation.

**Education** is the science and art of human development and deals with the training of the bodily organs, the senses, and the intellectual and emotional powers, with a view to the securing of the happiness of the individual and the well-being of the society or the state of which he is a unit.

Education may be divided into several departments, according to the nature of the material or subject-matter, and improvement of which it is directed, including (1) *physical education*, or the education of the bodily powers; (2) *intellectual education*, of the mind or intellect; (3) *moral education*, of the propensities, sentiments, will, and conscience; (4) *aesthetic education*, of the taste, musical, artistic, or literary, that is, depending on the sphere of the imagination; and (5) *religious or spiritual education*, of the religious sentiments, the spiritual instincts, that is, those which concern only the soul as a spiritual and immortal essence, and its relations to the Creator, the Infinite Spirit.

Education is also distinguished into *home or domestic education*, and *public or common-school education*, or considered as a means for the general enlightenment of the people, *popular education*; also into *private education*, that is, supported by private funds, and *national education*, maintained by the state.

Education must be distinguished from instruction, which is simply the communication of knowledge for a specific purpose. Education is subjective, instruction objective, but the aims of both may be identical, as when the communication of knowledge involves the development of faculty. In the limitation of its meaning to the work of the schools education is synonymous with pedagogy.

**School education**, generally called instruction, on account of the more limited character of its scope and the sphere of its application, is distinguished according to its grade, into (1) *primary instruction*, that is, the instruction given in elementary schools (such as the common schools, the primary grades of the high schools, or the lower subdivision of primary instruction); (2) *secondary instruction*, as given in academies, high schools (middle schools); (3) *higher instruction*, as given in colleges and universities; (4) *special instruction*, as of the blind, the deaf and dumb, and the imbecile; (5) *professional and technical instruction*, as in art schools, medical schools, military, naval or nautical schools, theological seminaries, schools of architecture, etc., for information in regard to which see the respective titles. The following outline indicates the chief branches of education and their principal subdivisions:

**FIRST ARTS:** Architecture; Drawing; Music; Painting; Sculpture.

**HISTORY:** Grammar; Orthography; Philology; Rhetoric; Writing.

**LITERATURE:**

**Mathematics:** Algebra; Arithmetic; Bookkeeping;

**Calculus:** Geometry; Navigation; Quaternions;

**Surveying:** Trigonometry.

**Medicine:** Anatomy; Dentistry; Dermatology;

**Mineralogy:** Gynecology; Hygiene; Laryngology;

**Metaphysics:** Ontology; Epistemology; Ophthalmology; Otorhinology; Otolaryngology; Pathology; Pediatrics; Psychiatry; Surgery; Therapeutics.

**Philosophy:** Aesthetics; Cosmology; Ethics; Logic; Metaphysics; Pedagogy; Psychology.

**Political Science:** Diplomacy; Finance; Government;

**Religion:** Theology; Archaeology; Astronomy;

**Science:** Chemistry; Geography; Geology; Mechanics;

**Metallurgy:** Meteorology; Mineralogy; Physiology;

**Physical Science:** Anthropology; Bacteriology;

**Biological Science:** Biology; Botany; Zoology;

**Physiology:** Ethnology; Histology; Ichthyology; Physiology;

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asmuch as they definitely recognise and reward superiority or excellence.

Naturally, children are but little prone to study, their fondness being rather for active sports and amusements; and hence, the awakening of an interest in the studies themselves, while an important object of the teacher's efforts, cannot be depended upon to incite the pupil to continuous industry. While there are some minds and temperaments that feel an almost innate desire for the acquisition of knowledge, and hence a love of study, on the other hand, the great majority of children have no such natural inclination, and are urged by the force of secondary motives, that is, by holding out inducements to study based upon the attainment of things in which they do take an interest.

All children are more or less, prone to emulation; they love to excel others, particularly in things that bring commendation and honor, in this respect resembling those of maturer years; for this principle of action has been recognized as leading to eminence in every department of human effort. Hence, in schools and colleges, emulation is an important and valuable incentive which the educator may, by no means, cast aside. Of course, it is not to be allowed to degenerate into personal strife, animosity, or jealousy; nor is it to be indulged in such a manner as to obliterate the pupil's real interest in the study pursued. It is always to be impressed upon the student's mind that he is working in a good cause, and that he should strive to attain to the highest possible degree of excellence in it; higher, if he can, than that which he has been attained by any of his fellow students. Thus what others achieve becomes the measure of what can be done by him if he exerts himself to the utmost, and after the standard beyond which he is to go in order to obtain the prize of excellence.

**Encouragement**, as an educational incentive, is of indispensable importance in dealing with a certain class of minds, particularly with those characterized by an excess of caution, timidity, and diffidence. Many teachers repress the exertions of their pupils in order to discern their true character, so as to be able to ascertain the amount of effort they may have put forth in order to accomplish an assigned task, or to avoid a temptation to do wrong. Adopting an opposite course, they sometimes condemn alike all who fail to attain it, making no allowance for diversity of talent, opportunity, or the power of will; whereas the true test of a pupil's merit is not the accomplishment of the task, but the exertion put forth and the self-control exercised in the endeavor to comply with the teacher's precepts or directions.

Encouragement consists in adjusting the standard of success to this peculiar circumstance and traits of the pupil. If the latter is dull, indolent, self-indulgent, feeble in will, and yielding easily to temptation, the educator who recognizes these traits, accepts with satisfaction the feeblest efforts at amendment which he sees have been put forth, and by judicious commendation induces stronger and more persistent ones, until the foundation of moral or intellectual strength has been safely laid. Timid children must be encouraged to lay aside their diffidence. It is shown that they are groundless. They must not be repressed by harsh words of censure, or by those forms of punishment which should be the exclusive penalty of wilful wrongdoing. On the contrary, they should be made to feel that, even if they have failed, they have won their teacher's approving smiles by their honest efforts.

Some minds, on the other hand, need urging rather than gentle encouragement; and the latter, in the form of excessive praise to talented pupils, is often a means of flattering their vanity, and thus operating as a kind of moral poison, destroying the force of every true stimulus to activity. The following are the suggestions of practical educators: Encouragement induces confidence and children, more than others, need it. Let it be given in all cases where this can be honestly done. To a want of this in the discipline of classes are to be ascribed the timidity and reserve so often manifested among pupils by a

hesitating manner, a low voice, and a tone of inquiry in response, especially to strangers. A proper degree of encouragement renders them confident and spirited, eager to tell what they know, and in an audible tone of voice. Encouragement has a powerful influence in promoting both mental and moral improvement.

**Enthusiasm** is an emotion of so strong a kind as to begot self-forgetfulness, and to awaken the most powerful energies of the mind. When made to rest upon an admission of the good, the true, and the beautiful, it becomes an educational stimulus of a very useful and effective character; it must not, however, be perverted to supersede the exercise of conscience, or the sense of what is right, and thus degenerate into moral weakness. Earnestness, rather than enthusiasm, should be the quality inspired by the educator; and this is to be effected through the force of example, because the sympathetic influence of the true teacher upon the mind of his pupil is almost without limit. Especially should that spurious kind of enthusiasm be repressed which is characterized by a habitual excitement about everything that is new, and which tends to destroy everything that is rational and stable in the mind. The enthusiasm of the educator is an important quality in the teacher as well as in the pupil; indeed, a teacher can scarcely meet with any true success in his profession who is not enthusiastically devoted to it.

**Evening Schools, or Night Schools**, have been established in many countries, generally in large cities, as a part of the public-school system, for two purposes—(1) to give to those of the school population who cannot avail themselves of the advantages of the day school an opportunity to obtain an elementary education; and (2) to enable adults who have finished the course of instruction in the public day school to acquire additional knowledge, especially on subjects relating to their particular occupations or professions. In England, France, Italy, and Germany, the evening elementary schools are for children employed in factories; in the United States, a large portion of the pupils of evening schools consist of persons who have passed the college age. In most cases, the school regulations exclude all children below a certain age, and also provide that no pupils shall be admitted who are not engaged in a useful occupation during the day.

Evening high schools, which offer instruction in the higher branches of study, or afford technical instruction to artisans and others, like the Cooper Union of New York, the Mary-land Institute in Baltimore, and the Polytechnic Institute of St. Louis, are powerful agencies for good. In some of the large cities of the United States, foreigners derive very great benefit from the evening schools, in the instruction afforded in the English language by teachers who speak the language of the students. Free evening drawing schools are quite numerous in many parts of the United States as well as in some of the countries of Europe.

There can be no doubt that such schools constitute an essential part of every common-school system, particularly in large communities, so which many children are obliged to leave the day school before they have acquired even the rudiments of an education. The office of technical schools, while different, is equally important, since the supply of skilled labor in any community is one of the most valuable elements of its wealth and prosperity.

**Faculty**, a term originally applied to a body of persons whom public law conferred or right is granted; hence, in a college or university, the faculty consists of those upon whom has been conferred the right of teaching as professors of specific subjects. The faculties of a university are subordinate corporations, each consisting of a body of teachers, or professors, in some particular department of knowledge. At first the European universities of Paris, Bologna, and Cambridge, faculties—that of arts and that of theology, to which, in the thirteenth century, those of canon and civil law and of medicine were added. The faculties of Paris were subsequently transferred from the University of Paris to the

German universities; the faculty of arts was afterward named the philosophical faculty. Many changes have been introduced in this part of university organization since that time. In American universities and colleges, the faculty consists of a body of professors, with the president at its head, and has the power of conferring degrees.

**Fellow**.—This term signifies membership in a learned society or of a college. At Oxford and Cambridge it is applied to a member of a college who participates in its revenue and government. Fellows are usually elected from the bachelors who have taken the highest degree in the university, and receive remuneration for the fellowships. At different colleges, both at Oxford and Cambridge, the fellowships are held under varying conditions. As a rule, they are worth from \$1,000 to \$1,250 a year, with rooms and commons, and are tenable for about seven years. In American colleges or universities fellowships are merely distinctions to worthy students. As a rule, they are worth from \$1,000 to \$1,250 a year, with rooms and commons, and are tenable for about seven years. In American colleges or universities fellowships are merely distinctions to worthy students. As a rule, they are worth from \$1,000 to \$1,250 a year, with rooms and commons, and are tenable for about seven years. In American colleges or universities fellowships are merely distinctions to worthy students. As a rule, they are worth from \$1,000 to \$1,250 a year, with rooms and commons, and are tenable for about seven years.

**Grammar Schools**, so-called, not because they gave instruction in English grammar, but from the fact of their making the teaching of Latin and Greek—particularly the former—sometimes exclusively, the former—their especial aim, existed in England from the earliest times. In England, the endowed grammar schools are very numerous, and many of quite ancient foundations. They are the same as what have been called classical schools, belonging to the class of *middle schools*, and distinguished by a secondary character. They correspond to the *gymnasiums* of Germany and the *lycees* of France; in the latter, however, there is a course of instruction in modern languages, running parallel with the ancient course of classical pupils, beyond the college age.

Grammar schools, in the United States, were originally of the same character as in England, but the gradual development of the common-school system in the United States, joined with the partial decline of Latin and Greek as instruments of education, and the demand for studies of a more practical character for the ordinary duties of life, have led to a different application of the term *grammar schools*. The study of English grammar having taken the place of Latin grammar in schools of an elementary grade, such schools came to be designated *grammar schools*, and the former grammar or classical schools received the name of *high schools* or *academies*. In most of the public-school systems of the United States, Union, grammar schools are schools of a grade between the primary schools in which the first rudiments of instruction are imparted, and the high schools, in which the instruction, so called, has a primary, an intermediate, and a grammar department.

**Gymnasium**, a term applied, in ancient Greece and Rome, to a place of physical exercises. It is the name of the principle or law according to which every action becomes easier by repetition. The result of such repetition or practice, when the process is complete, is called a habit or *habitus*, and thus acquired possessions, and so distinguished from original or instinctive endowments. The principle of habits operates throughout the whole of the development of the intellect as mental. Thus all muscular actions

become perfected by repetition and habit, requiring less and less coöperation of the conscious mind. We thus see that habit, memory, to which indeed it is so closely allied, has its basis in certain properties of the physical organism.

In the region of mental activity we observe the effect of habit in the way in which thoughts become firmly associated with another in definite groups or series, as the consequence of repetition or custom, and also in the way in which the thinking processes gain in facility and exactness through practice. The emotional sensibilities again are under influence of the same law, though in a less obvious manner. The operation of the principle here is seen in the building up of firm attachments and permanent affections toward the objects and persons in the child's environment, with their correlative sense of want and craving when these are absent. Finally, habit rules in the domain of voluntary action. All the higher exercises of will in checking impulse and controlling the thoughts and feelings become perfected by customary performance, and in that way the so-called *habits*, as temperance, truth, etc. are built up. Habits have been divided into *intellectual* and *moral*, and also into *active* and *passive* habits.

From this short account of the nature and scope of habit we may easily see that it is the great guiding principle of education. According to Locke, it is the secret of instruction in all arts, and, indeed, in conduct too, to get what we would teach settled in the pupil by practice till it becomes a *habit*. Good habits should be formed at as early a period as possible; because repetition shows that when thoroughly established in childhood or youth, they generally continue, with more or less strength, through life. Hence the importance of making these qualities and observances habits, which constitute the elements of practical success in every walk of life: such as punctuality, order, regularity, and perseverance; to which may be added neatness, courteous attention, the waste of others, forbearance, and self-control.

For the same reason, bad habits should be eradicated before they have reached that stage, after which they are almost entirely disappear. It is, indeed, rarely the case that thoroughly fixed habits are wholly removed; hence the teacher should strive to counteract their evil influence, or neutralise their activity, by the use of a contrary nature. In dealing with the bad habits of children, the teacher should appreciate, and make due allowance for, the force of habit.

**Humanities** (*Lat. humaniores* or *literae humaniores*), those branches of education, or study, which are included in what is called polite or elegant learning, as languages, grammar, rhetoric, philology, and poetry, with all that pertains to what is called polite literature, including the ancient classics. The name implies that the study of these branches, in opposition to the physical sciences, which especially develop the faculties of the body, has a tendency to *humanise* man—to cultivate particularly those faculties which distinguish him as man, in all his relations, social and moral; traits which make him a truly cultured man. In the older systems of education, the humanities took the lead; in the new, they have been, to a considerable extent, superseded by studies deemed more practical, from a utilitarian point of view. The contest between the humanities and the so-called practical studies, as branches of higher education, is still rife. The humanities are, at present, more commonly designated *belles-lettres*.

**Illiteracy** is a term used at present to denote the inability to read and write. The mere fact as to how many persons in any community are unable to read and write is not, in itself, of very great value; but in relation to ignorance and knowledge, it is highly important, as marking the dividing line, on one side of which may be placed all those who are hopelessly condemned to the perusal of books, and are, therefore, deprived of all the advantages to be derived from their study or perusal; and, on the other, all who,

by means of such knowledge and such sources of information, have been placed on the high-road to thrift, skill, intelligence, culture, virtue, and every other element of the highest civilization.

To the individual, illiteracy is a most deplorable misfortune; to the community, in proportion to its extent, it is an acknowledged evil. The principle of free schools is derived from a consideration of the numerous evils which popular ignorance entails upon a community; and of this ignorance illiteracy is the exponent. On the same principle is based all legislation for compulsory attendance at schools. These principles have, however, been called in question; but very rarely. Parents, it has been said, cannot justly be forced to give their children a certain amount of education, unless it is assumed that this education is as necessary for the mind as food and clothing are for the body; but of course this is an assumption that cannot be maintained.

National systems of education have regard to the good of the community, not merely, or chiefly, to the good of the individual. The want of literary education is the source of numerous ills to the body politic, which legislation should strive to remove. The statistics of illiteracy are thus of the greatest value, in indicating the progress or retrogression of a nation in the most important elements of well being.

The following percentages indicate the relative illiteracy of the chief nations of the world. In Roumania, 88.4 per cent of the population can neither read nor write; in Servia, 79.3 per cent; in Portugal, 79.2; in Spain, 68.1 per cent; in Russia, 61.7 per cent; in Hungary, 47.8 per cent; in Austria, 35.6 per cent; in Italy, 32.9 per cent; in Greece, 30 per cent; in Belgium, 10 per cent; in Ireland, 7.9 per cent; in France, 4.7 per cent; in England, 3 per cent; in Scotland, 2.6 per cent; in The Netherlands, 2.3 per cent; in Finland, 0.5 per cent; in Denmark, 0.2 per cent; in Switzerland, 0.18 per cent; in Sweden and Norway, 0.08 per cent; in the British Empire, 0.05 per cent; and in Saxony, Bavaria, Württemberg and some other German states only rarely a person can be found who cannot read and write. In the United States the ratio of illiteracy among the whites is 6.2 per cent.

**Illustration** in its most comprehensive meaning is the rendering of an idea or truth clear to the mind. This is done by showing what is presented in a relation of likeness to some known thing, and so promoting the process of mental assimilation. Hence all illustration proceeds by connecting by some link of similarity, affinity, or analogy, what is new and obscure with what is old and familiar. Illustration may be employed in the description of some concrete object, as in the use of illustrative analogies in setting forth geographical or historical facts. It is chiefly required, however, in expounding all abstract ideas and principles. Here the mind depends upon a series of suitable examples or instances which may serve to exhibit the abstract idea in a living, concrete form. Illustration, though it commonly refers to bringing out points of similarity, includes the setting forth of contrast as well.

**Imagination** may be popularly defined as the power of mentally picturing things. If this picturing means the recalling to mind of something which we have actually seen, it is known as *reproduction*, or *evocation*, whereas if it means the formation of a new mental image it is known as *constructive* imagination. The imagination is exercised upon mental pictures, the fictitious products of poetry and art, but about common realities.

The cultivation of the imagination thus subverts two, main ends—knowledge and æsthetic delight. The first is illustrated in the kind of concrete subject to which poetry and history, where the pupil is required to reproduce the impressions of his past experience, with a view to constructing images of the things of the world, are subjected by the teacher. It is further illustrated, though in a less obvious way, in science-teaching, the abstract principles of which

can only be reached by preliminary processes of imagination.

The cultivation of the imagination for æsthetic purposes is carried on in close connection with the development of the feelings and the taste. Here the object of the educator should be to render the child's mind sensitive and responsive to what is beautiful, pathetic, sublime in the objects of nature, so that his imagination may be stimulated to a vivid realization of the same. The imagination is commonly included among the faculties, and is a strong and highly developed in the child; yet it is important to distinguish between the random, unguided movements of childish fancy and the orderly progress of a trained imagination.

**Individuality** may be defined as the sum of mental and moral qualities which characterize a particular person, distinguishing him from other persons. Such individual peculiarities have their conditions in the physical organism, a fact clearly recognised in the doctrine of *temperament*.

According to the universal biological law, that all life is not sound to exist one another (within certain limits), every child's brain, together with its constitution as a whole, has its own peculiar stamp from the first. And this physical peculiarity serves to determine the special mental traits, intellectual and moral. Within the limits of the typical human development every child is impelled to follow a line of development of its own. This impulse is much more marked in some children than in others. A strong individuality is an integral element in that later moral product which we call character.

The educator is perhaps naturally inclined to regard individuality as an obstacle and a limitation, since in extreme cases it implies resistance to his guiding influences. Here, however, we must distinguish between individuality which involves no deviation from the normal type, and eccentricity, which implies such deviation. Rightly considered, individuality is not something wrong which the educator has to correct, but one chief aim of the work of education itself.

The object of the teacher should be to make a child's individuality a source of intellectual and moral peculiarities, with a view to develop all that is valuable in these, and so produce a fine individual. This furtherance of individuality has to be harmonised with the development of a typically common human being. Thus, in intellectual education we should aim at securing a certain general culture of the faculties by a common plan of study, and, at the same time, a special training of individual aptitudes by selected or optional studies.

**Inductive Method** is but another name for the *developing method*. It is so-called because it is based upon the principle of logical induction, or the process of deriving general principles from an observation and comparison of individual facts. Instead of teaching definitions, principles, and rules arbitrarily, and illustrating them by means of examples who uses the inductive method, calls the attention of the pupil to a sufficient number of the facts to enable him to find the principle or rule for himself. The learning of the definition, which, in the deductive method, is the first thing to be done, in the inductive method, is the last step in the process. Most text-books follow the deductive method, but the most effective elementary instruction is inductive.

**Instruction** means the informing of the mind by a communication of knowledge. It is commonly distinguished from *education*, which aims not so much at the distribution of knowledge as at the development of faculty or power. Instruction or teaching is correlated with learning, or the acquisition of knowledge, and is not to be determined by the surrounding conditions.

**Interest** describes the effect of feeling, and more particularly pleasurable feeling, in rousing and sustaining the attention. A feeling may be the impulse toward the acquisition of an object on the mind, as when a child is attracted by a pretty picture; or may be due to process of association and suggestion, as when



a child is interested in watching the preparation of its food. Interest is closely connected with curiosity. A child desires to know what can be known about objects that are interesting to him, such as his pet animal, his toys, etc. From this it is apparent that the mother or teacher has at the outset to seek to awaken in the child's mind a feeling of interest in the subject presented to it. This she will do partly by bringing out all that is striking, pretty, etc., in the subject, and partly by connecting it with known sources of interest in the child's surroundings. One chief aim of the instructor should be to develop new interests, answering to the different domains of knowledge to be dealt with, as history and natural science. It is evident that in order to awaken such a feeling of interest and study attention must be paid to individual differences of sensibility.

**Intuition, Intuitive Method.**—In its original and proper sense intuition is the apprehension of an object by one of the senses, and more particularly the sense of sight—in other words, the act of perception. In a secondary manner it has come to mean the grasp or understanding of an idea in so far as this approximates in character to a perception of the senses. Thus the distinct imaginative picturing or realization of any object, as a volcano, is a mode of intuition. We may thus be said to have an intuitive knowledge of any object or idea that we can distinctly perceive or imagine. Such intuitive knowledge is marked off from symbolic knowledge—*e. g.*, that of large numbers, which does not admit of being reduced to a sensible or picturable form. It will be evident, therefore, that intuitive method in teaching consists in reducing abstract ideas as far as possible to sensible concrete, in setting out in the exposition of any abstract notion, such as an angle, a verb, justice, with concrete illustrations addressed to the senses or to the pictorial imagination. It thus corresponds pretty closely with the inductive method.

**Judgment, Training of.**—This department of intellectual culture needs no special attention, if the whole educational system, in other respects, is judicious and rational; *i. e.*, adapted to the individual body to age (degree of maturity) and peculiarities of character or endowment. Where this is not the case, an efficient corrective may be applied by bringing into exercise the pupil's mental faculties in various ways and in connection with various subjects. The departure must be taken from the sphere of the pupil's experience; he must be led (1) to an accurate observation of particulars—minute details; (2) to their collation, as preliminary to generalization; and (3) to their classification under appropriate heads. When general principles or rules have been established in the pupil's mind in this way, his judgment will be brought into

play in the application of the principle or rule to particular objects or facts.

Thus, in natural history, after the pupil has learned the characteristics of genera and species by minute and accurate observation of individual specimens, he cannot, without an exercise of judgment, determine whether any particular specimen, previously unobserved, belongs to one or the other of the genera or species. He must have a clear conception of the distinguishing qualities, both of the individual and of the class, in order to determine whether the characteristic exists or not. As regards concrete objects, the judgment is exercised from a very early age, and is constantly trained more or less by every legitimate process of intellectual education; but as regards abstract truths, this faculty is one of the last to attain a full or mature development.

Accuracy in judging depends very much on the mental habits formed during the period of early education. Habits of attention, careful observation, dispassionate, conscientious reasoning, and a profound and earnest love of truth, will qualify any person for the exercise of a sound judgment in regard to any subject of study or investigation. A mental character based upon such habits will be free from prejudice, and will readily learn to eliminate all passion from its intellectual processes; and hence its judgments, being solely based upon the facts acquired, will be correct or the contrary, in proportion to the accuracy and extent of the information possessed.

**Lectures, or Lecture System,** a method of giving instruction by formal expositions, generally written out and read to the learners. Lectures are, however, quite often extemporaneous, or delivered without previous preparation of the language. The lecture differs from the lesson chiefly in dispensing with the ordinary processes of the recitation room—question and answer, repetition, etc. The learners simply listen, or take notes, while the teacher reads or speaks, with or without illustrations by means of the blackboard, maps, pictures, apparatus, etc.

Lectures, as a system of instruction, are chiefly depended on in higher education—in colleges and universities, also in technical, scientific, and professional schools, because the students are supposed to have acquired a considerable maturity of intellect, enabling them to resort to knowledge without exercises specially designed to awaken attention or stimulate the understanding, but to exercise their own faculties in arranging it in their minds for use—in other words, coordinating it with their previously acquired knowledge.

**Liberal Education.**—This term is frequently used synonymously with collegiate or university education, but there is no good reason for thus restricting its meaning. It signifies generally an education which embraces a

fair knowledge of literature, science, and art, acquired for its own sake rather than for an objective purpose. It is difficult, however, to define the term accurately. According to Lord Brougham, the liberal education is that in which he who has learned "something of everything and everything of something," and according to Professor Huxley, he "who has learned to love all beauty and his neighbor as himself."

**Libraries** constitute one of the most important instrumentalities for stimulating the intellectual improvement of the people, as well as for the mental and moral training of pupils in schools. This has been recognized in the legislation of many of the states of the American Union, by making provision for supplying the schools and school-districts with libraries of interesting and useful books.

The value of a school library will depend upon the character of the books of which it is composed, and the uses to which it is applied. A large and expensive collection of books is not needed; but the books should be instructive and interesting to children, so that through their perusal they may not only obtain useful information, but imbibe a taste for reading. By this means, an antidote may, in part at least, be applied to the influence of the trashy, exciting, and sensational literature, which so greatly abounds at the present time, and which is so apt to corrupt both the minds and morals of the young.

The spread of education has called into existence innumerable smaller libraries, ready of access, and providing such literature as the special tastes of readers demand. This public library system has naturally been most developed in highly educated countries, such as Germany, France, Great Britain, and the United States.

**Public Libraries** existed in ancient Egypt and Assyria, and Ptolemy is credited with the honor of introducing a public library at Athens about B. C. 337. Cicero and various wealthy Romans made collections of books, and several Roman emperors established libraries, partly with books obtained as spoils of war. By far the most celebrated library of antiquity was the Alexandrian.

In modern times, libraries of any note were founded in the second half of the eight century by the encouragement of Charlemagne. In France one of the most celebrated was that of the king, Louis XIV., at Versailles, and in Paris, in Germany the libraries of Fulda, Corvey, and in the eleventh century that of Hirsebau, were valuable. In Spain, in the twelfth century, the Moors had seventy public libraries, of which that of Cordova contained 250,000 volumes. In Britain and Italy libraries were also founded with great zeal. The Vatican library, Rome, and the Bodleian, Oxford, are particularly valuable in rare books and manuscripts.

### Chief Foreign Libraries

When Founded	CITY AND COUNTRY	LIBRARY	VOLUMES	Dominant Language	When Founded	CITY AND COUNTRY	LIBRARY	VOLUMES	Dominant Language
1902	Aarhus, Denmark	City	200,000	Danish	1682	Edinburgh, Scotland	Advocate	527,000	English
1754	Amsterdam, Netherlands	University	800,000	Dutch	1583	Edinburgh, Scotland	University	237,000	English
1837	Athens, Greece	University	290,000	Greek	1743	Florence, Bavaria	Royal University	237,973	German
1827	Augsburg, Bavaria	Royal Public	300,000	German	1771	Florence, Italy	Public	212,397	Italian
1811	Bamberg, Bavaria	Royal Public	300,000	German	1714	Florence, Italy	Royal Central Nat'l	844,021	Italian
1460	Basel, Switzerland	Public	250,000	German	1484	Frankfurt, Prussia	City	322,901	German
1661	Berlin, Prussia	Royal	1,230,000	German	1484	Frankfurt, Prussia	City	322,901	German
1864	Birmingham, England	Birmingham Free	312,870	English	1816	Ghent, Belgium	City University	270,000	German
1712	Bologna, Italy	Royal University	300,000	Italian	1450	Glasgow, Scotland	University	352,000	French
1618	Bonn, Prussia	University	355,000	German	1708	Göttingen, Prussia	University	500,000	English
1738	Bordeaux, France	Public	200,000	French	1737	Hague, The Netherlands	Royal	536,000	German
1702	Breslau, Prussia	Royal University	200,000	German	1696	Hamburg, Germany	City	228,000	Dutch
1827	Brussels, Belgium	Royal	600,000	German	1696	Hamburg, Germany	City	228,000	Dutch
1802	Budapest, Hungary	Magyar Nemzeti Museum	400,000	Hungarian	1529	Hannover, Prussia	Royal	359,000	German
1835	Budapest, Hungary	Magyar Nemzeti Museum	400,000	Hungarian	1650	Hannover, Prussia	Royal	359,000	German
1229	Cambridge, England	Cambridge Univer	300,000	English	1396	Hannover, Prussia	Royal	359,000	German
1811	Christiania, Norway	City University	450,000	Norwegian	1558	Jena, Saxony	Grand Dural Univ	370,000	German
1855	Copenhagen, Denmark	Royal	720,000	Danish	1663	Kiel, Prussia	Imperial University	247,000	Russian
1482	Copenhagen, Denmark	University	475,000	Danish	1834	Königsberg, Prussia	Royal University	478,700	German
1394	Cracow, Galicia	University	490,000	Polish	1834	Königsberg, Prussia	Royal University	478,700	German
1817	Darmstadt, Hesse	Royal Grand Dural	490,032	German	1870	Leeds, England	Central Public Free	266,624	English
1802	Dorpat, Russia	Imperial University	228,922	Russian	1409	Leipzig, Saxony	University	550,000	German
1880	Dresden, Saxony	Royal Public	490,000	German	1409	Lisbon, Portugal	National	490,000	Portuguese
1601	Dublin, Ireland	Trinity College	297,009	English	1850	Liverpool, England	Public	271,721	English

## Chief Foreign Libraries—Continued

When Founded	CITY AND COUNTRY	LIBRARY	VOLUMES	Dominant Language	When Founded	CITY AND COUNTRY	LIBRARY	VOLUMES	Dominant Language
1753	London, England.	British Museum.	2,000,000	English	1419	Kosicek, Mecklenburg.	University.	340,000	German
1711	Madrid, Spain.	National.	600,000	Spanish	1714	St. Petersburg, Russia.	Imperial Public.	1,594,240	Russian
1804	Maina, Hesse.	City.	200,000	German	1728	St. Petersburg, Russia.	Imperial Academy.	400,000	Russian
1768	Manchester, England.	Public.	369,833	English	1714	St. Petersburg, Russia.	Imperial University.	360,000	Russian
1770	Milan, Italy.	National.	238,771	Italian	1728	St. Petersburg, Russia.	Corsy Institute.	250,000	Russian
1828	Moscow, Russia.	Public.	800,000	Russian	1655	Stockholm, Sweden.	Royal.	314,902	Swedish
1746	Moscow, Russia.	Royal National.	411,000	Russian	1770	Strasbourg, Alsace.	University.	388,000	German
1350	Munich, Bavaria.	Royal.	1,100,000	German	1755	Stuttgart, Wurtemberg.	Royal.	831,000	German
1772	Munich, Bavaria.	University.	500,000	German	1872	Tokio, Japan.	Imperial University.	358,595	Japanese
1771	Naples, Italy.	Royal National.	363,670	Italian	1872	Tokio, Japan.	Imperial.	220,000	Japanese
1865	Odessa, Russia.	Imperial Univ.	250,000	Russian	1880	Tomak, Siberia.	University.	200,000	Russian
1815	Ottawa, Canada.	Parliament.	300,000	English	1747	Tubingen, Wurtemberg.	Royal University.	475,000	German
1802	Oxford, England.	Public.	600,000	English	1780	Turin, Italy.	National.	250,000	Italian
1367	Paris, France.	National.	3,000,000	French	1620	Upsala, Sweden.	Royal University.	327,000	Swedish
1763	Paris, France.	University.	800,000	French	1458	Utrecht, Netherlands.	Tilks University.	250,000	Dutch
1764	Paris, France.	Arsenal.	400,000	French	1458	Vaius, Italy.	National Marcian.	415,752	Italian
1629	Paris, France.	St. Genevieve.	340,000	French	1440	Vienne, Austria.	Imperial.	900,000	German
1643	Paris, France.	Maisons Library.	250,000	French	1875	Vienne, Austria.	University.	710,000	German
1764	Parma, Italy.	Royal.	303,838	Italian	1817	Warsaw, Russia.	Imperial University.	545,305	Polish
1348	Prague, Bohemia.	Royal University.	341,000	German	1650	Weimar, Saxe-Weimar.	Grand Ducal.	270,000	German
1807	Rio de Janeiro, Brazil.	National.	275,766	Spanish	1658	Wolfebuttel, Brunswick.	Dunal.	300,000	German
1875	Rome, Italy.	National Central.	400,000	Italian	1402	Wurzburg, Bavaria.	Royal University.	370,000	German
1450	Rome, Italy.	Vatican Apostolic.	250,000	Italian					

## Public Libraries of the United States Above 50,000 Volumes

When Founded	CITY	LIBRARY	Number of Volumes	When Founded	CITY	LIBRARY	Number of Volumes
1818	Albany, N. Y.	New York State Library.	430,831	1896	New Orleans, La.	Public Library.	70,000
1846	Albion, Pa.	Carnegie Free Library.	57,340	1820	New York City.	Free Library.	115,700
1824	Annapolis, Md.	Maryland State Library.	80,000	1828	New York City.	Library of the New York Law Inst.	65,777
1820	Augusta, Me.	Maine State Library.	27,000	1830	New York City.	Mercantile Library.	23,194
1826	Baltimore, Md.	Enoch Pratt Free Library.	244,345	1820	New York City.	N. Y. Society Library.	100,000
1827	Baltimore, Md.	Library of the Peabody Institute.	160,626	1895	New York City.	Public Library.	1,287,154
1827	Baltimore, Md.	New Mercantile Library.	11,000	1852	New York City.	Y. M. C. A. Library.	84,454
1853	Bangor, Me.	Public Library.	61,746	1894	Northampton, Mass.	Forbes Library.	110,000
1857	Boston, Mass.	Boston Athenaeum.	220,000	1872	Notre Dame, Ind.	Lemonnier Library.	65,000
1852	Boston, Mass.	Public Library.	84,917	1872	Omaha, Neb.	Public Library.	71,523
1852	Boston, Mass.	Public Library.	903,349	1898	Peoria, Ill.	Public Library.	99,000
1826	Boston, Mass.	State Library of Massachusetts.	138,525	1894	Philadelphia, Pa.	Free Library.	310,630
1820	Brockline, Mass.	Public Library.	41,803	1731	Philadelphia, Pa.	Library Company.	23,194
1867	Brockline, N. Y.	Free Library of Pratt Institute.	92,000	1895	Pittsburg, Pa.	Carnegie Library.	290,000
1836	Buffalo, N. Y.	Public Library.	215,534	1867	Pittsburg, Pa.	Mercantile Library.	100,000
1837	Cambridge, Mass.	Cambridge Public Library.	73,393	1864	Portland, Me.	Public Library.	64,000
1837	Chicago, Ill.	Public Library.	221,625	1867	Portland, Ore.	Library Association of Portland.	60,645
1867	Chicago, Ill.	Newberry Library.	283,458	1874	Portland, Ore.	Library of the Oregon Historical Soc.	22,000
1872	Chicago, Ill.	Public Library.	339,282	1873	Providence, R. I.	Public Library.	123,895
1838	Cincinnati, Ohio.	Cincinnati Public Library.	272,112	1851	Richmond, Va.	Virginia State Library.	160,000
1833	Cincinnati, Ohio.	Young Men's Mercantile Library.	77,000	1850	Richmond, Va.	Keynotes Library.	60,000
1869	Cleveland, Ohio.	Public Library.	291,882	1840	Sacramento, Cal.	California State Library.	138,126
1838	Columbus, Ohio.	Ohio State Library.	102,374	1851	St. Louis, Mo.	Public Library.	225,000
1820	Concord, N. H.	New Hampshire State Library.	123,915	1846	St. Louis, Mo.	Washington Univ. Library.	60,000
1860	Dayton, Ohio.	Dayton Public Library and Museum.	70,000	1853	Salem, Mass.	Essex Institute Library.	95,378
1886	Denver, Colo.	Public Library of the City of Denver.	99,040	1848	San Francisco, Cal.	Sutro Library.	200,000
1886	Des Moines, Iowa.	Iowa State Library.	80,902	1879	Seattle, Wash.	Public Library.	80,000
1868	Detroit, Mich.	Public Library.	330,000	1818	Springfield, Ill.	Illinois State Library.	50,000
1861	Fall River, Mass.	Public Library.	78,000	1857	Springfield, Mass.	City Library.	152,343
1821	Frankfort, Ky.	State Library of Kentucky.	100,000	1896	Syracuse, N. Y.	Public Library.	70,000
1790	Harrisburg, Pa.	State Library of Pennsylvania.	134,000	1896	Taleto, Ohio.	Public Library.	80,000
1834	Hartford, Conn.	Cas Memorial Library.	87,492	1796	Topska, Kan.	Public Library.	25,000
1829	Hartford, Conn.	Public Library.	92,000	1796	Treston, N. J.	New Jersey State Library.	73,538
1858	Hartford, Conn.	Watkinson Library of Reference.	70,542	1789	Washington, D. C.	Library of the Department of State.	65,000
1873	Indianapolis, Ind.	Public Library.	121,629	1789	Washington, D. C.	Library of House of Representatives.	125,000
1838	Jackson, Miss.	Public Library.	80,000	1865	Washington, D. C.	Library of the Surgeon-General's Office.	162,295
1869	Jersey City, N. J.	Free Public Library.	101,832	1898	Washington, D. C.	Public Library of the District of Columbia.	120,000
1846	Kansas City, Mo.	Public Library.	66,000	1898	Washington, D. C.	Riggs Memorial Library.	91,129
1828	Leasing, Mass.	Public Library.	60,000	1836	Washington, D. C.	Scientific Library of Patent Office.	84,388
1848	Little Rock, Ark.	Arkansas State Library.	51,000	1846	Washington, D. C.	Smithsonian Institution Library.	180,000
1872	Los Angeles, Cal.	Public Library.	112,000	1868	Washington, D. C.	U. S. Bureau of Education Library.	82,000
1847	Louisville, Ky.	Public Library.	80,000	1868	Washington, D. C.	U. S. Geological Survey Library.	190,000
1844	Lowell, Mass.	City Library.	71,355	1869	Washington, D. C.	S. S. Senate Library.	99,664
1867	Lynn, Mass.	Free Public Library.	72,409	1869	Waterbury, Conn.	Rilas Bronson Library.	69,664
1878	Madison, Wis.	Public Library.	172,463	1869	Wilmington, Del.	Wilmington Institute Library.	59,696
1869	Minneapolis, Minn.	Public Library.	160,000	1870	Worcester, Mass.	American Antiquarian Society Lib.	130,000
1867	Newark, N. J.	Public Library.	100,000	1812	Worcester, Mass.	Free Public Library.	160,000
1852	New Bedford, Mass.	Free Public Library.	95,000	1859			
1867	New Haven, Conn.	Public Library.	85,000				
1869	New Orleans, La.	Howard Memorial Library.	52,000				

**Library of Congress.**—The Library of Congress was established in 1800, destroyed in 1814 by the burning of the capitol, afterward replenished by the purchase by Congress of the library of ex-President Jefferson, 6,760 volumes, in 1815, 35,000 volumes destroyed by fire in 1862, partially replenished by an appropriation of \$75,000; increased (1) by regular appropriation by Congress; (2) by deposits under the copyright law; (3) by gifts and exchange; (4) by the exchange of the Smithsonian Institution, the library of which, consisting of 40,000 volumes, was in 1866, deposited in the Library of Congress with the stipulation that future accessions should follow it. Other special accessions

have been; the Peter Force collection of 22,529 volumes, 37,000 pamphlets, purchased 1867; the Coust de Rochambeau collection of manuscript, purchased 1883; the Toner collection of 24,484 volumes and 10,000 engravings, gift in 1898 of Mrs. Gardiner G. Hubbard.

The collection is now the largest in the western hemisphere, and third in the world. It comprises about 1,750,000 printed books and pamphlets (including the law library, which, while a division of the Library of Congress, still remains at the capitol), manuscripts, maps and charts, pieces of music, and photographs, prints, engravings, and

lithographs. Of the printed books, probably one-sixth are duplicates not in use.

The collection is rich in history, political science, in official documents, National, State, and in literature and in Americana, including important files of American newspapers and original manuscripts. Many of the rare books and manuscripts belonging to the library are exhibited in show cases on the second floor.

**Manners.** the genuine or simulated manifestations of disposition toward each other, which occur in the intercourse of humans, including the ordinary use of the word *manners* restricts it to those personal and visible peculiarities of deportment which characterize the intercourse

mentioned. The agents commonly employed for this purpose are the eye, the voice, language, and gestures.

When persons are brought together without previous knowledge of each other, or with no common ground of taste or experience between them, custom has prescribed a conventional code of formal manners, characterized as etiquette, which serves to relieve the awkwardness of the situation. That this, however, is temporary in character, and not intended to survive its original uses, is evident from the fact that after it has, in great measure, been discarded, any attempt to revive it, as the exclusive medium of kindly expression, is regarded as just cause for resentment. The fugitive character of mere etiquette can never constitute it a substitute for that abiding kindness of disposition which finds expression in genuine politeness.

Manners, therefore, are more decidedly moral in their nature than a superficial observation would lead us to suspect; hence the usual association of "morals and manners."

The basis of agreeable manners is that humanity, or feeling of brotherhood, which, in a greater or less degree, pervades the human race, and which every century, by its multiplied means of communication, is tending to extend and strengthen. It is, therefore, essentially Christian, and persons may be regarded, not as an accomplishment merely, but as one of the legitimate ends of a thorough education. In social intercourse, agreeable manners are far more powerful than intellectual accomplishments; while the displeasure produced by rude manners often neutralises moral worth, and renders mental acquisitions, however great, comparatively useless. Momentous issues—even the destiny of a lifetime—may hang upon the apparently unimportant question of manners. To educate thoroughly, and neglect the means by which the person is to be made effective, is self-evident folly.

Beyond the ordinary rules of etiquette, no set rules can be given for the production of good manners; since, in addition to the moral basis above referred to, the person is dependent upon temperament; but no precept is half so powerful in furtherance of this end as the daily example of the teacher, the parents, or other persons with whom the pupil is brought into daily contact. The indirect though constant insistence upon the claims of every individual to respect and kindly attention, which is a practical recognition of this by the pupil, together with the daily example referred to, constitute, perhaps, the most effective method for the grafting of agreeable manners on the conduct of the pupil.

**Memory** indicates the mind's power of retaining impressions so as to be able to recall them for after use. The fundamental property of memory, called by psychologists retentiveness, underlies all acquisition, whether of knowledge or of moral habits. The development as the faculty of memory this power of retention lies at the base of all learning. It is governed by its own laws, chief among which are those of interest and attention, and those of association. It is one of the first powers to be developed, and as such claims the teacher's attention at the outset. Although in general strong in children, it presents peculiarities and marked individual differences in respect both of the general or average power of retaining, and of the retention of special varieties of impressions and knowledge.

The importance of the faculty as pre-eminently the organ of learning, has led educators to give it much attention.

What are the means of obtaining it in the minds of children? (1) It is plain that impressions will be reproducible in proportion to the strength and vivacity with which they are first made. This strength depends partly on the natural capacity of the child, partly on whether the stimulus in the object is such as to produce a strong impression. Thus it follows that wherever a real object can be presented to a child, it should be used in preference to any picture of it, and that a picture of it is better than a mere verbal description. Moreover, if more than one sense can be

employed, so much the better. If any object is to be remembered, the child will remember more easily, if he can touch, smell, and taste it, as well as see it. This arises partly from the fact that these different processes produce strong impressions, but partly also from what we call our second principle of memory.

(2) Every means should be used to concentrate the attention on the object. If we wish to make a child remember an object, the object must be allowed to lie before the child's eye or mind for some time.

(3) There must be frequent repetition. An object or thought is reproduced easily when it has been made to occupy a large space in the mind. The power of reproduction is limited by time, and the mind can only reproduce within certain limits in this respect. If, therefore, an object is to be reproduced, the faded impression must be renewed; and the renewal of the impression strengthens its hold. It is thus that a fact may become indelibly imprinted on the memory. The value of the repetition cannot be overestimated, but great care must be taken not to make it wearisome.

(4) The power of reproduction greatly depends on the state of the health. That there is a very close connection between this power and the body, is proved most conclusively by the numerous instances in which abnormal states of the brain are accompanied by abnormal developments of memory. When, therefore, a child forgets, it must not be always attributed to carelessness. A child learns a word on Monday, and knows it with perfect accuracy; but when he comes, on Tuesday morning, to repeat it, he finds he cannot. In all probability, the impression was weak to begin with, and he is unable to resist the many and more interesting ideas which have intervened; but the lesson is not lost. The original impression is there.

Various devices, called mnemonics, have been proposed in ancient and modern times for facilitating the retention and reproduction of what is learned. These refer to verbal retention, as in memorizing a speech, a series of names, etc. The underlying principle of all such mnemonic systems is the association of the consecutive beads of a verbal composition with the divisions of an extended surface or inclosed space, as the compartment of a building, so that when the eye or the imagination runs over these, the order of their arrangement in space would at once suggest the order in time of the words.

It is now commonly recognized that these devices can have but a very limited value, and are likely to be a hindrance, rather than a help in certain cases. In modern educational systems verse-form, rhyme, and alliteration, together with the inventing of disconnected matter—a jumble of exceptions to a grammatical rule, with the semblance of a connected meaning—have commonly been resorted to for the purpose of aiding the memory. The utility of producing verbal material, such as the names even of a reign, in a visible form, by means of a diagram, is well known to every teacher. All such contrivances depend for efficiency on the working of the laws of association—contiguity, and similarity, apart or in combination.

It is indisputable that we all instinctively tend to shorten the process of memorizing by a number of such ingenious devices, and that they may properly be made use of by the teacher. At the same time, great care must be taken lest, by an excessive use of these, the learner lapse into a mechanical way of learning. It is a far better exercise for the mind, and for the memory too, to associate things to be learned by their natural ties, rather than by artificial ones. And a truly scientific management and control of memory will consist in forming a habit of associating the mind on the subject matter to be learned, of judiciously selecting important points, and arranging the whole with referentialness, and finally of making the fullest use of the laws of association in linking part with part, and the whole with what is already known.

**Mischievousness**, as applied to the disposition of a child, or school pupil, is the occa-

sional transgression of an established rule in a playful spirit, but without a malicious intention. This disposition is usually the result of the union of humor, or love of fun, with a good bodily health. The exuberance of spirits thus produced generally finds vent in actions which are denominated mischievous.

This spirit is so widely different from the usual breaking of rules with an evil intention, that the easy suppression of a continued exhibition of it rests entirely with the teacher; the good nature with which the mischievous act is accompanied generally causing the perpetrator to desist on a slight warning, or to bring the mischievous spirit under speedy control, two qualities only are necessary in the teacher—quick discernment of its real nature, and tact in correcting it. The want of these sometimes leads to needless irritation on both sides, and may end disastrously to the teacher's influence, and through that, to the discipline of the school.

If, on the other hand, the good humor of the transgressor is met by a similar feeling on the part of the teacher, the task of correction is greatly facilitated. In this case, while in the end, it secures a respectful obedience to the part of the pupil. If the mischievous disposition is not corrected in this way, it leads to vicious habits, which will tend to undermine, or permanently deprave the moral character.

**Moral Education** has for its sphere of operation the culture of those principles which influence or control the voluntary action of human beings. The elements of self-control exist in the greatest degree, and in every kind, as a part of its original constitution. They are distinct from its intellectual faculties, and need a special education, which is far more important than that of general education, because it contributes in much higher degree to the good both of the individual and of society.

The subject of moral education is *duy*, and its office is both speculative and active; that is, (1) to improve the moral character, rectitude in the pupil's mind—to teach what duty is—and (2) to cultivate a desire to do what is right for its own sake—to respect duty, to moral obligation, and to feel a sense of right—to listen to the voice of conscience; to which may be added, as an important additional object, to implant in the young mind such maxims as will aid the moral sense, and enable it to triumph over the natural propensities and desires, when the latter are in conflict with it.

The means employed in moral education are the following: (1) *Precepts*, addressed both to the understanding and to the conscience, the object being to enlighten the latter, which of itself does not recognize specific right or wrong; (2) *example*, appealing to the conscience, and being enforced by the love and respect felt by the child toward its educator, leading the former to feel that whatever is done by the latter is right, and hence should be imitated; (3) *habit*, inducing, by means of repetition, an inclination to act in the same way under the same circumstances; (4) *exercise*, for the purpose both of strengthening the moral feelings brought into play, and of forming habits. Exercise, in moral education, is just as important as in physical or intellectual education; indeed, there can be no training in moral education without making this on, the teacher must avail himself of every possible circumstance that arises in connection with his intercourse with the pupils, and make acquaintance with each other, to give occasion for this exercise, and thus form a basis for the desired culture of the moral faculties.

This culture or training must have a twofold object—(1) to cultivate virtues, and (2) to correct vices. Among the former, as especially necessary, may be enumerated truthfulness, honesty, justice, candor and modesty, kindness or benevolence, diligence, obedience to parents, authority, gratitude, fidelity to every promise or trust, and patriotism; and among the latter, the opposites of these, as lying and deceit, a disposition to steal, cruelty

to animals, unkindness and injustice to playmates, violence and combative spirit, temper, anger and irritability, obstinacy, laziness, irresolution, leading to procrastination, excessive self-esteem, leading to arrogance and self-conceit, etc.

These are specific qualities of character which need a particular recognition and treatment on the part of the educator; but when the moral sense has been thoroughly awakened, the Christian moral principle is to do unto others as we would that they should do unto us, we will comprehend, in approbation or condemnation, every class of actions, and shall be the means of all just discrimination as to what is virtuous and what is vicious.

But the conscience is not developed in children; and very often, not even in adults. Hence the need of moral discipline, in order to afford to the educator the means of bringing to bear upon his pupils external restraint, as preliminary to self-restraint; for it must be borne in mind that any government that does not contemplate the cultivation of the elements of self-control can soon be considered as forming a part of moral education. The three elements of sensibility usually appealed to in connection with moral discipline are, *the fear, love and respect*.

Children should be made to *fear* to do wrong; and this should be brought about as much as possible by what Herbert Spencer calls the *method of nature*, that is, by making punishment the necessary consequence of the wrongful act, on the principle involved in the maxim, "The burnt child dreads the fire." This eliminates the personal element in the fear implanted in the mind of the child. He does not *fear* the teacher, but he fears to offend—to do wrong. The same consideration excludes from discipline all threatening, scolding, and harsh words, for the purpose of engendering fear, and especially excludes all punishment. The fear to be excited in the mind of the child should not be an apprehension of personal safety, leading to meanness, cunning, and deception as a means of self-protection, but should be the fear of the displeasure that life has little relation to the concerns of that life. This want of relation sprung originally from the fact that the literary class, and the practical class, was a class apart, having only slight connection with the people of people who, possessing few political rights, were unworthy of consideration. The instruction given, therefore, was purposely of a kind to emphasize the exclusiveness of the educated class. Under the changed political conditions of our day, however, the tendency has steadily been to equalize the two classes in intelligence—to lift up the masses to the level of the educated, on the one hand, and, on the other, to bring the studies of the school and college more into accordance with the daily life of the majority.

Traces of the original exclusiveness still remain, however, in the antiquated, unpractical character of the instruction, as mentioned above. Almost every youth, on entering upon the business of life, becomes completely ignorant of the principles of arithmetic that he studied, for instance, so that he has little application to the concerns of daily life; the bookkeeping which was mastered so much difficulty, seems now, at this later date, to have been filled with theoretical cases which have no parallels in actual experience; even the geography, in which he attained such proficiency, has little place in his daily routine; while algebra, geometry, and many other studies, have none at all.

The result is a feeling of inferiority when he is brought in contact with other persons whose training has been entirely that of practical life, which leads him to suspect that his time has been wasted. Not till long afterward, perhaps, does he recognize the fact that the principles on which both theoretical and practical knowledge are based are the same, and that the ability to apply these principles was his chief want. The feeling of disappointment referred to might have been entirely removed, if, in his instruction, the teacher had kept constantly in mind, not the mental discipline alone,

but the *mental discipline* and the *adaptability to the affairs of life* of the knowledge used in acquiring that discipline.

One of the most useful instruments for accomplishing this double purpose is the newspaper. The *arithmetic* which is often taught by the use of unusual and improbable examples could be made a living and interesting thing by the use of problems to be found in its pages, which illustrate the actual prices of articles in daily use. Interest, discount, exchange, the price of bonds and stocks, could be made so familiar to the pupil in the way that the change from school to counting-house, which is now attended with such a want of ease and so much disappointment, would seem but the continuation of study in another class.

Reading, also, if taught from the newspaper, would familiarize the pupil with the terms used in the daily conversation of professional and business men; and, through the reports of proceedings in every field of human activity, fresh interest could be aroused in studies already taken up, while attention could profitably be called to those which are ordinarily pursued in more advanced courses; and a partial preparation for disquisitions could thus be unconsciously be made. *Geography and history* would receive increased attention, if they could be connected with the reports of the interesting events from all parts of the world which are daily chronicled, by inquiring into the position on the map, population, form of government, etc., of the different countries referred to. By following, in this way, the records of campaigns and battles, a knowledge of the topography of the country could be obtained almost without effort, which would be easily retained in the memory of the most careless scholar; while opportunity could, at the same time, be taken for digressions into its history.

Through its reports of strikes, labor troubles and cooperative associations, the newspaper and periodicals could also be made a medium for inculcating, in a familiar and unobtrusive way, the rudiments of political economy, usually so dry and uninteresting; while the accounts of great engineering feats, astronomical discoveries, and other studies, which are the voyages of discovery, would be more eagerly listened to, if the pupil were made to understand that the algebra, geometry, or geography which he had studied, were the fundamental relation to them all. The thought, also, that he might one day take part in similar work, would act as a spur to renewed exertion.

Any means within the teacher's reach of diverting the studies pursued of the dry, text-book character should be taken advantage of; and this cannot be done in any way so easily as by investing them with a human interest by showing that men and women similar to those with whom he daily associates are the actors in all these stirring events.

For this purpose hardly any medium is superior to that of the daily paper. The objections to the newspaper as a text-book, some of the facts were unfit for youthful minds to know, and that the hasty manner in which they were reported rendered their accounts not only worthless as models but injurious, as they no longer valued. To the first, it may be said that newspapers are now so universally read that pupils can hardly fail to see them or hear their contents discussed; and to the second, that active educators, having brought into the employ of the newspaper so large a share of the best talent, specimens of composition may now be found in any industrial or intellectual pursuit, and are not only innumerable but are not only exceptionally able in matter, but worthy of imitation for lucid statement and grace of expression.

The ability, independence, and rapidly increasing circulation of the daily press are fast rendering it a potent factor in education, and in countries where the necessities of daily life leave little time for that higher education which demands leisure and a competency for its accomplishment, a double purpose would be served by using it as a means of instruction, as not only giving to the minds of the pupils practical culture, but

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also habituating them to the constant use of the newspaper as, perhaps, their chief source of intelligence.

**Object Teaching, or the Pestalozzian Method.**—A method of instruction in which objects are employed by means of which to call into systematic exercise the observing faculties of young pupils, with the threefold object, (1) to cultivate the senses, (2) to train the perceptive faculty, so that the mind may be stored with clear and vivid ideas, and (3), simultaneously with these, to cultivate the power of expression by relating with the ideas thus formed appropriate language.

The merit of introducing object teaching as a special method of elementary instruction, is usually attributed to those who, like Comenius, Locke, Rousseau, Haesdow, Rochow, and others based their systems of education, more or less, upon the same principle; that is, they recognized the necessity of communicating ideas, or of affording to the mind the means to grasp ideas from objects, by actual perception, before attempting to teach the verbal expression of those ideas; and that, without such ideas, mere "book-learning" is useless.

Pestalozzi appears, however, to have had only a slight knowledge of the works of those educators. Inspired by the reading of Rousseau's *Emile* to study the phases of mental growth, he arrived at the conclusion that the teaching of his day was fundamentally wrong, from its violation of, or inattention to, the laws of mental development. These laws he believed to be, (1) that the knowledge of things should precede that of words; (2) that, for the acquisition of this knowledge, the only effective agents, in the first stages of mental growth, are the senses, chief of which is the eye; (3) that the first objects to be studied by young children are those directly surrounding it, and these only, in their simplest forms and relations; and (4) that from these objects as a center, the sphere of knowledge should be widened by a gradual extension of the powers of observation to more distant objects.

The first instruction, therefore, according to this plan, should consist in concentrating the attention upon those objects, and in a way as to result in a thorough training of the observing faculties, so that the conceptions with which the mind is stored may be as well defined, and as true to nature, as possible. So impressed was Pestalozzi with the correctness, and the supreme importance, of this method, that he declares that the sum of his achievements in education is the establishment of the truth that "the culture of the outer and inner senses is the absolute foundation of all knowledge—the first and highest principle of instruction."

Object teaching should be begun as early as possible, and in the manner of the kindergarten, and should be followed by objective and conceptive teaching, which should be carried through every branch of learning. The mental growth of pupils, however, should not be retarded by a superfluous use of this method. A safe criterion, by which the teacher may, at any moment, whether he has made a proper use of the object method, may be found in the self-activity of his pupils, their ability to grasp, in their answers to his questions, the general fact, proposition, or law.

This method is justly called the *development method*, the pupils' minds being made to develop themselves, the teacher only suggesting what they are to discover. Every pupil is, as it were, to rediscover every science in the genetic method, a difficult task for the teacher, and apparently a circuitous way for the pupil. But because of its thoroughness it is the most rapid way of learning; and its results are indelibly fixed in the mind. This method, also, if early begun, and consistently carried out, is successful in every other way, and saves precious time which, later in life, may be devoted to those higher branches that lie beyond the common-school course, but which are every year becoming, in many cases, highly desirable, and, in some, indispensable.

**Order.** In school management, implies (1) the existence of a judicious system of regulations, and (2) a uniform and habitual observance of them by the pupils. It is one of the most important elements in which the schoolmaster enables the teacher to concentrate all its educative agencies without embarrassment or interruption.

The characteristics of good order are (1) attention on the part of the pupils to the legitimate work of the school, (2) obedience and respect to teachers, (3) decorous deportment—the absence of a tumult, rudeness, frivolity, and frolicsome actions, calculated to disturb the school, and (4) propriety and exactness in the school evolutions and drill. Under the result of skill and tact on the part of the teacher; but it cannot be fully maintained unless he is vested with suitable authority, so as to be able to correct disorder as soon as it manifests itself. General disorder in a school can result only from bad management, indicating incompetency on the part of the teacher.

**Patience** is the calm endurance of necessary characterizing. This quality, though similar to *perseverance* in the prolonged effort which its exercise presupposes, differs from it chiefly in the equal temper with which that virtue meets the patient spirit of the most important elements in the character of a successful educator. Many occasions, indeed, will occur, when patience will be the only virtue that will command success. Its cultivation, therefore, is desirable, both on this account, and because of its value in mental discipline. Its possession, moreover, is necessary both to the teacher and to the pupil. For the former, it is of special value in his treatment of the varying dispositions with which he has to deal.

The provocations to impatience and intolerance are so many and so constant, that, without patience, the teacher's life will be a continued series of annoyances. Impatience in children is the result either of temperamental irritability, or of a preliminary error in dealing with it, the teacher should remember that nothing so tends to develop and foster it in his pupils as a constant practical exhibition of his daily intolerance.

As nothing is so infectious as ill-temper, so nothing tends so rapidly to curb ill-temper as that quiet forbearance which a patient spirit evinces. The child, like the adult, is a mental power, also, act with much greater effect upon the calmness of the judgment is undisturbed by ill-temper or impatience. Perseverance may, indeed, exist without patience, and to a certain extent may accomplish its objects; but it is safe to say that more than half the good results which perseverance aided by patience might accomplish, are thrown away if patience does not accompany it.

**Peabody Education Fund.**—A fund established by George Peabody in 1867 and 1869 for the purpose of fostering education in needy communities in the Southern states. Of the \$3,500,000 thus contributed, state bonds of Mississippi and Florida to the amount of \$1,380,000 were afterward repaid. The fund was placed in the charge of a board of fifteen members, and the trust was to terminate at the discretion of the trustees in thirty years. The chief beneficiaries were elementary schools, preferably those already established, to which grants were made proportional to the number of students. It soon became evident that the chief need was for trained teachers and Peabody normal school, later Peabody College, was established in 1875 at Nashville, Tenn. The amounts thus distributed have averaged \$75,000 annually. By a vote of the board in 1906 the trust is to be dissolved as soon as its affairs can be wound up, a large sum going to the new George Peabody College for Teachers.

**Pedagogy, or Pedagogics**, the science and art of giving instruction to children, particularly in school, or as by a school-teacher. This term is more generally used in Germany than in this country. In the latter it is the science in which the theory and art of the teacher or educator are designated as *instruction* or

*education*; indeed, the word *pedagogue* is, in these countries, used as a term of reproach.

**Perception.** Observation.—By the act of perception is meant the process of the mind in unifying the impressions received through the senses into a knowledge of objects. Perception is the first stage in that intellectual elaboration of sense-impressions which constitutes abstract thought. To perceive, i. e., distinguish and recognize objects, implies normal and trained senses. When sense-impressions are indistinct, the knowledge of objects will be incorrect. But it implies more than this, viz., the interpretation of the impressions received at the moment by the aid of past experiences. Thus a child that sees its ball as a real object is translating visual impressions into imagined tactile experiences (feeling, lifting, rolling the ball). Hence perception is acquired. An infant does not see things as things, and cannot distinguish by the eye a flat drawing from a solid body.

The ordinary circumstances and needs of life compel every child to connect and interpret the impressions received through the senses. But such spontaneous acts of perception are apt to be rough and defective. The ends of exact knowledge require a more careful and systematic inspection of the objects, which is marked off as *observation*, and the branch of intellectual discipline that aims at securing it is known as the training of the *observing faculty*. As observed by any common object, as a rivet or a tree-trunk, so as to note all its peculiarities of form, color, etc., implies a strong, wide interest in objects. Thus the child, in its measure, and when the observing faculty has been drawn out from the first, the pleasure springing from the use of the organs of sense and from the gaining of new knowledge may be counted on as a sufficient motive.

A habit of observation presupposes both presence and openness of mind; in other words, freedom from mental preoccupation and reverie, and a willingness to see things just as they are, and not as we fancy them or would like them to be. The highest kind of observation combines exactness or minuteness, comprehensiveness, and rapidity. The close connection between exact observation and scientific induction renders it important to exercise the observing faculty by object-lessons as a preparation for science-teaching. Observation forms, however, the necessary preliminary to all studies; e. g., geography, mathematics, language.

**Perseverance.**—This is that quality of will by which an end is steadfastly pursued to the disregard of all extraneous sollicitations. It is closely connected with exact concentration on a subject of thought; and it may be said indeed to be a firm concentration of the mind to an object of desire. The moral value of this quality as one of the highest manifestations of will, and its great practical utility in life, render it incumbent on the moral educator to develop it to the utmost. It is, moreover, a moral quality which the discipline of the will is peculiarly well fitted to foster and strengthen. The learner should be led to see how success in study depends on perseverance, and how often, as the failure of the best and ablest scholars, as patient and unremitting effort defeats mere superiority of natural talent.

**Phonic Method**, a term applied to a method of teaching reading, in accordance with which pupils are taught to pronounce the words to use the sounds of the letters, instead of their names, so that they may at once perceive the result of the combination, and thus without difficulty be able to read the words. For example, when the pupil is required to pronounce the word *dog*, he does not say *de-o-g*, *dog*, but gives to each letter the proper sound, phonetic, and thus at once pronounces the word as the necessary product of the elements thus combined. This method is considered by teachers to possess many advantages over the old-fashioned way of committing to memory the names of the letters of the alphabet, and then teaching them to read by spelling exercises.

**Physical Education** is that systematic training of the bodily powers which tends to render them, in the highest possible degree, efficient in their several functions. The necessity for this training is generally acknowledged, as a basis for the higher departments of culture. Among the ancients—the Persians, the Greeks, and the Romans, especially, the highest respect was accorded to physical culture; and the means employed were generally well adapted to the purpose, although mostly empirical; but, at the present time, the researches of science supply a far better and more accurate basis for an effective system of bodily training.

Physical education looks to two objects:—(1) to encourage a normal development of bodily powers; and (2) to check morbid growth. Incidentally to these, of course, the preservation of health—that is, protection against disease—is an important object; since a condition of health is the foundation upon which all physical culture must rest; indeed, if children are successfully protected from disease influences and disturbances, normal development must result.

(1) The application of appropriate means to stimulate or guide the development of the bodily powers constitutes what is called *physical training*. This training may be (a) general, or (b) special. In the former, the general physical exercise must have for its object general development; beyond that, the special purpose of the training must dictate the nature of the exercises to be employed. Military drill, it is true, is often employed in schools to promote general development, but there is very much required in military discipline that is quite unnecessary for ordinary physical culture.

Such exercise, however, must not look exclusively to muscular development, but to the prompt use of muscular power in obedience to the dictates of mind. Such power systematically exercised in any given direction becomes almost automatic, as is seen in the case of the skillful oarsman, rider, or swordsman; or in adepts in athletic games, such as those of ball and cricket. All such means of physical culture become of special value, as bringing the powers of the body under the immediate control of the will; and, hence, under the name *athletics* they have been generally encouraged by the public, in the direction of superior education. In the same category are to be placed the exercises which regard the development of other physical powers, as the senses, the vocal organs, the hands, and, in a closer relation to intellectual education, the brain.

(2) To check morbid growth or to prevent disease, careful attention must be given to the surrounding of the child, particularly in school; as there he is subjected to constant restraint, and hence cannot exercise his natural instincts which would prompt him to escape from such surroundings. The preservation of children from morbid influences in school depends upon a great variety of circumstances.

The practical aim of physical education, under the influence of modern life, is almost always intellectual. Gymnastics and calisthenics, however, indirectly exert a moral influence which, of itself, makes their practice desirable. This is the moral influence which is produced in generous minds by the consciousness of bodily health and power, and a disposition to use that power worthily, being of influence to the child, by giving with it an element of immorality, which leads its possessor to acts of duplicity and meanness to preserve his equality.

There is still another phase of physical education to be considered—that which relates to the joint action of the mind and body through the medium of the senses. The minute subdivision of labor characteristic of the age in which we live, by giving a utilitarian value to the cultivation of the senses, is rapidly constituting this an element of increasing importance. Already, the success of numerous trades and occupations is dependent upon a nicety of discrimination by means of the eye, the ear, the taste, or the touch; and the number of these is steadily

increasing. The cultivation of the senses, therefore, is desirable from a merely utilitarian point of view; while for general culture, such as is required in many of the arts, its absolute necessity is manifest. Many considerations are to be taken into account, however, in the subject of physical education one of constantly increasing importance.

**Pictures.**—There are two main uses for pictures in schools—one to exercise and develop the moral sentiment, and the other to convey information to the mind, to fix it there, and to exercise the faculty of constructive imagination.

With regard to the latter use it may be pointed out that it has long been accepted as an axiom that the best explanation of a thing is the sight and study of the thing itself; and the next best is a photograph or exact unembellished picture of the thing. This mode of explaining and conveying information has been largely used from quite early times, but is still capable of considerably greater development—especially in the departments of geography and history.

But besides conveying information, pictures may be used, and indeed are almost indispensable, for the cultivation of one of the most valuable of the intellectual faculties—the constructive imagination; both when the mental images constructed are exact or nearly exact copies of some original which cannot be seen, or when the constructions are new combinations of material already acquired (as in science and in art, both literary and pictorial) in which latter case—when the combinations are new—pictures serve the purpose of suggestive models.

The use of pictures as aids to the memory is too widely recognised to need more than mention. There is one minor objection, however, which cannot be too often protested against; and that is in lessons of *observation*. In such cases pictures can never be properly used except when the pictures themselves are the objects to be observed, or when the picture instead of the thing itself differs hardly at all from studying a written account of the thing.

**Play.**—Play is activity carried on for the sake of the pleasure which attends it, and not of any ulterior object. As a variety of action, play is marked off from work and all serious occupation by its spontaneity, its freedom, and its want of the serious attitude which accompanies the latter. Play includes the exercise of limb and of mental faculty, so far as this is spontaneous, and not consciously subordinated to the ends of efficiency and growth.

It has been pointed out by Herbert Spencer that much of children's play is imitative of the actions of adults, and may be viewed as an anticipation of the functions of mature life. The region of play is an important field of observation for one who wishes to study the characteristics of childhood. It has, moreover, its educational uses. This is the case with all games that exercise the physical organs and the senses, and those that call into action the mental faculties. The well-known class of social games, again, which involve the exercise of measure of organization, and a common submission to rules are of undoubted value as an aid to moral education.

The educator has something to do both in the way of restraining and in guiding the play impulses of children. An absorbing passion for games and any degree of interest in them incompatible with necessary work must be strenuously opposed. On the other hand, the play-impulse may be directed into new, healthier channels, and so its value as a source of pleasure increased. Any such control, since it tends to destroy the spontaneity which is of the essence of play, should be attempted with much caution and judgment. The question how far it is possible to regulate the play-impulse for educational purposes has been discussed in connection with the kindergarten system.

**Praise and Blame.**—These constitute one of the most natural and proper means of influencing children's actions, and molding their moral character. The child is in gen-

eral very sensitive to the good opinion of others. An infant shows the germ of this love of approbation when it turns to its mother for an approving recognition of some little feat. On the other hand, the withholding of such approval, or the manifestation of disfavor, is a source of pain.

The instructor has to make frequent use of this desire for others' commendation, especially in the early stages of education. Before the child can itself judge what is right, and before the love of goodness is sufficiently strong, praise and blame are a valuable means of prompting and guiding its actions. Care must be taken, however, not to resort to either in excess. Lavish praise bestowed on actions which have little moral value is injurious. Commendation of what is meritorious and in cases of bare duty must be distinguished from the colder approval which is proper to the fulfillment of this last. On the other hand, too frequent censure is apt either to lower its sting by familiarity or to discourage and embitter the child.

Finally, it should be remembered that praise and blame have only a subordinate and temporary function in moral education. It is not well that the child lean too much on others' favorable opinion. It should be the object of the educator to exercise the child in the discrimination of value, and to lead to a commendation of value, and gradually to lead off its thoughts from the approbation itself to the moral standard which determines it. The child in school should be led to what is right for its own sake, and to find its highest satisfaction in an enlightened self-approval.

**Precocity.**—By a precocious child we understand one whose mental powers are developed in advance of his age. Precocity is thus tantamount to rapid development. It may show itself in some special direction, as in the case of the born musician, artist, or poet, or as exceptional advancement in intellectual power as a whole, as in more than one instance of famous savants. In the latter case a proportion of famous men were remarkable in youth, if not in childhood. At the same time precocity is no guaranty of lasting intellectual powers, as rapid development seems to mean in many cases arrested development. Hence the low opinion held of precocity by classical as well as by modern writers. Enough has been said to show the special attention required in dealing with the precocious child. As something exceptional, he cannot easily be fitted into rules and methods intended for the average mind.

The educator must recognise intellectual forwardness, and not attempt to force superior abilities into a too narrow and cramping mold. At the same time he must be alive to the dangers of a rapid mental and cerebral development, and distinctly discourage a clever boy or girl from such a rate of advance beyond the standard of his other years as would be detrimental to his health, to his physical powers, and so to a healthy and prolonged process of mental improvement.

**Psychology.**—Mental science, or psychology, is the science which has for its special subject-matter the various activities which make up our mental life. As dealing with the phenomena of the inner world of mind or "consciousness," it stands in contrast to the physical sciences, which have to do with those of the external, material world. At the same time, psychology holds a close connection with one branch of physical science; *viz.*, *physiology*.

We have to study mental phenomena not only in themselves as we observe them directly in our own minds, or indirectly through their outward manifestations in the minds of others, but also in connection with their physiological accompaniments and conditions, that is to say, the brain and the nervous system as a whole. It thus will be seen that psychology is the chief source of the principles or laws which make up the science or theory of education.

Since the educator has to work on the mind as his material, he requires to understand its inherent properties and the laws by which it is governed. The successful training and de-

veloping of the mind in any direction depends on our satisfying the necessary conditions of mental growth. The exercise and improvement of a child's memory can only take place by a fulfilment of the natural laws of memory (interest and association). Hence a knowledge of these laws is indispensable to one who would carry on the work of training minds intelligently, and with the assurance of following a right method.

The science of psychology deals with mind in each of its three principal phases, *knowing or intellect, feeling or emotion, and activity or will*. And the special laws of each of these great departments of mental life furnish the basis of a corresponding branch of education; viz., (1) intellectual education, the culture of the feelings, or æsthetic education; and (3) the development of the will and character, or moral education.

**Recitation.** In American colleges and schools, denotes the rehearsal of a lesson by pupils before their instructor, or the repetition of something committed to memory.

The manner in which a teacher should conduct the daily recitations of his class is a matter of very great importance, since apparently perfect recitations may be gone through with which only have little educative value, but may even be productive of positive harm to the mind of the pupil. The surest guide, in this respect, is that which is derived from a consideration of the essential meaning of the word education, no method of recitation having any value which does not keep constantly in view the development of the pupil's mental power. It should always be remembered by the teacher that the supreme object of the recitation is to accustom the pupil, by daily practice, to use the faculties of which he is so abundantly supplied.

Many a so-called recitation results, by too much explanation on the part of the teacher, in a reversal of the functions of the teacher and his class. The teacher recites to the latter, instead of the latter to the former. The passive attitude of mind in which pupils listen to a long explanation is the very attitude from which they need to be aroused.

There are two stages in the development of a mental power as produced by the exercises of the classroom—(1) the knowing what to say, and (2) the saying what is known. The first stage the pupil is supposed to have reached by the study of the lesson; the second, and most important one, is not passed through by the pupil in the case above supposed.

Of far greater service is it, therefore, to the pupil, to be allowed to state the result of his study in his own language, halting and imperfect though it be, than to compel him to listen to an exposition by the teacher. Under the first condition, it will be apparent, at every step, whether he really understands his lesson; and, if he does, every day will add to the confidence of his intellectual progress, and his ease of mental action, and give to his recitation its highest educative result; while, under the second—the condition of a "passive recipient"—there will be no opportunity for every discerning person an inexact apprehension of the thought presented, a certain degree of insincerity, strengthened into a mental habit through fear of ridicule, and mental powers "rusting in disuse."

The first requisite for skillfully conducting a recitation is a thorough preparation by the teacher for the particular lesson he is to teach, so that he may be able to follow each step taken by the pupil, and may stand ready, at any moment, to supply the needed word in which the pupil is unable to embody his thought. Another point to be remembered is the order in which the different parts of a subject are presented. Where these parts depend upon each other, the natural order is to be followed frequently do, a skillful teacher will so order the recitations of a class that each other step of the subject which are the natural stepping-stones to one another, shall be presented first, such an arrangement conducting powerfully to a correct comprehension of the subject as a whole.

In some studies, as in the natural and exact sciences almost always—this method is absolutely necessary; but, while in other

branches its value is not so apparent, the advantage to be derived from its adoption is generally considerable.

A thorough comprehension by the pupils of the subject under consideration will insure the maintenance of three other conditions necessary to success in teaching, and usually quite strenuously insisted on by writers on the subject; namely, *animation, attention, and a natural tone*. When pupils understand what they are reciting, their attention and animation are, by that fact, made certain; and a natural tone is almost inevitably adopted. In youth, the appetite for new truths is so eager, the exultant feeling which accompanies the conquest of difficulties is so keen, that the reflection of this in the voice and manner of the pupil is a matter of certainty.

**Religious Education** is that which has for its special object the cultivation of that faculty of the human soul by means of which it is enabled to realise the existence and constant presence of the Deity; to know Him, and to commune with Him in worship and prayer. Some have designated this the *religious sentiment*; but strong exception has been taken to that term, as belittling the basis of religion in the human soul.

An experience of human nature, in its various degrees of culture, shows that there are what may be called religious institutions, common to all minds of whatever grade of development; but that while these may prompt to worship, yet, without religious instruction, they can lead only to superstitious and debasing practices.

The religious or spiritual instinct does not necessarily involve any act of the intellect; for those whose intellectual education and development are quite inferior often show a surprising degree of spiritual insight and religious fervor. This fact, however, does not supersede the necessity of appealing to the intellect in imparting a knowledge of those religious truths which are communicated by divine revelation; but, in receiving these truths, the intellect assumes the attitude of faith rather than of inquiry; that is, it receives them as having been communicated by the authority, or the authority, of the source whence these truths, or dogmatic teachings, emanate, it does not exercise its powers to establish their validity, or to determine their truth in their true import and relations. Hence the intellect is not to be cultivated by means of religious instruction, although its exercise cannot wholly be dispensed with.

The specific office of religious education is thus twofold—(1) to cultivate the religious instincts, and (2) to impart religious truth. The one is accomplished by means of devotional exercises; the other by dogmatic teachings.

In the first stage of religious education, appropriate exercises constitute almost the only agency of instruction, and the religious truths being requisite (such as are usually contained in the catechism); but, in the more advanced period of culture, the imparting of dogmatic instruction becomes simple. Simple prayers and hymns, with just enough teaching to enable the child to realise their full significance, are the usual and the most effective means of exercising the religious faculty.

It must, however, be borne in mind that the mere saying of a prayer, or the singing of a hymn, will not suffice, unless the exercise, any more than merely committing to memory a definition or a rule will exercise the intellect. The mechanical repetition of prayers, in religious education, is just as useless as rote-teaching in intellectual education. By an inattention to this principle on the part of parents and religious teachers, many a child, as he grows up, comes disgusted with religious devotion, while others imbibe the notion that religion is only a matter of forms and ceremonies, or the repetition of dogmatic teachings. In such a case, the religious instinct becomes dormant for the want of due exercise.

The relation of moral and religious education should be carefully studied. In the latter may be found the former, and the relations which mankind sustain to each other;

and the latter, with those which man as a spiritual being sustains to the Infinite Spirit, the creator and preserver of all things. In the one, the principle addressed is that of conciliar precept. For right, in the other, it is the religious principle, the spiritual instinct, by which man is brought into communion with his Creator.

In a certain sense, these two departments of education are independent; for conscience operates independently of religion; but a religious sanction is the strongest foundation for moral precept. For right, in the other, it is the religious principle, the spiritual instinct, by which man is brought into communion with his Creator.

In imparting religious instruction, the same principles are to be applied as in intellectual education, as far as language is the vehicle of the instruction. Very much of the religious teaching given in the Sunday-school is of no value, because of the neglect to observe these principles. Committing to memory formulated dogmas, verses from catechisms, doctrinal lessons, etc., without any proper appreciation of their significance, can be of little service, and in some cases may do positive harm. Oral instruction plays a most important part in this kind of teaching; and Bible expositions, when clear, definite, and illustrative, always prove the most effective as well as the most attractive means of instruction.

**Rhodes Scholarship.**—The Cecil Rhodes, British statesman, who died at Cape Town, South Africa, March 26, 1902, directed in his will dated July 1, 1900, that a part of his fortune, estimated at \$10,000,000, should be applied to the creation of a fund, for the support of a certain number of scholarships covering a three-years course at the University of Oxford. He directed that the selection of the recipients of this gift should be made two from each state and territory of the United States, or one hundred in all, fifteen from Germany, and from one to nine from each of the British colonies.

In most of the states the selection is made by a committee appointed by representatives of the colleges; in some the appointments are made in rotation by the leading colleges.

The conditions regulating the award of scholarships in the United States provide that the candidates shall have satisfactorily completed the work of at least two years in some college of liberal arts and sciences. Except under extraordinary circumstances the maximum age limit must be twenty-four years at the time of entering upon the scholarship at Oxford. To be eligible the candidate must be a citizen of the United States, or the son of a citizen, and must be unmarried. Each student receives an allowance of \$1,500, payable in quarterly installments, which is just enough to enable him to pay his college fees and necessary expenses.

At the beginning of Michaelmas term, October, 1904, there entered Oxford twenty-two Rhodes scholars; forty-three were American, and twenty-seven were English. In 1906, the full number, 120 in all, were in residence, and thereafter this number was to be maintained, the vacancies being filled as men were graduated. The first examination in the examination in the United States took place in January, 1911. There will be examinations also in 1913, 1914, and so on, omitting every second year. The number of examinations are not competitive, but qualifying.

**Scholasticism**, a name generally applied to the Christian philosophy of the middle ages, though there is no agreement among scholars as to its exact definition. In its first period, which extends from the ninth to the twelfth century, it was confined to theological problems. Among the greatest representatives of scholasticism are Scotus Erigena, Gerbert (Pope Sylvester II), and Albertus Magnus. About the middle of the thirteenth century the controversy between the *Realists* and

**Nominalists** led to the full development of scholasticism, which denied to philosophy any right to extend its speculations beyond the tenets of the church, but assigned to it the task of systematizing the doctrine of the church, and of defending them. Thus, the scholastics were led to cultivate chiefly logic and dialectics.

Among the greatest scholastics during the classic period of the system were Alexander de Hailes, Albertus Magnus, Thomas Aquinas, and Duns Scotus. In the fifteenth century, scholasticism began to decline; and, though subsequently the scholastics tried to revive it, and have partly retained its method of teaching to the present day, it has never been able to recover anywhere its mediæval supremacy. Its importance in the history of education depends chiefly on the influence which it exerted, during the middle ages, upon all schools, but more especially upon the cathedral and convent schools.

**School Management** is a department of the teacher's profession which includes (I.) the organization of the school, and (II.) its conduct. Under the former, must be considered (1) the *classification*, (2) the *distribution*, as to order and time, of the branches to be taught (course of instruction, or program), and (3) the proper *assignment* of the work of instruction (in a graded school) to several teachers, either in accordance with the class system or with the departmental system.

The conduct of the school has reference (1) to instruction, and (2) to discipline. Great care should be taken, by means of a carefully constructed program, or daily order of exercises, to secure to each subject its proper amount of time, according to its place in the course of instruction, as well as to insure an equitable advancement on the part of the pupils in the study of the grade, as preliminary to promotion.

The promotion of pupils is a matter of great practical importance in the management of a school. One of the chiefest errors made by teachers is the too rapid advancement of their pupils. Promotion should always be based upon a careful examination; and, in a graded school, care should be taken that every pupil is passed through a legitimate manner—that is, without hurry or cramming. When the school is ungraded, the advancement of individual pupils is to be considered; there is the natural and legitimate tendency, so as to secure thorough proficiency as the basis of promotion.

Government is, also, an important department of school management; since, without efficient government, all attempts at effective school instruction must be fruitless.

**Self-Command, Self-Control.**—These terms refer to the higher exercise of the will in restraining and controlling the natural impulses and propensities. Thus, when a child makes an effort to abstain from a forbidden action, or to master a feeling of anger, it is exercising self-control. This self-regulation shows itself in three directions, answered by the three directions of control, viz., the control of the thoughts, of the feelings, and of the actions.

The perfect control of the whole mind by a good and rational will is the highest result of mental development, and should be the end of education. Such complete self-mastery involves a firmly fixed habit, the establishment of which is a long and difficult process, especially in the case of impulsive and passionate children. The educator must early begin to exercise the child's will in an effort at self-command. Thus intelligent instruction should be accompanied by attention, a restraint of the impulses to bodily movement and wandering thoughts.

Again, the moral educator has from the first to encourage the child to control his feelings, and more especially to govern his temper. The moral educator is further concerned with the development of that species of self-control which consists in denying ourselves the satisfaction of our own desires, an exercise in which the principle of all virtue and excellency lies.

**Self-Education** is that part of the work of mental development which the individual

carries out for himself. It is a necessary supplement to the early school education, in which the learner is surrounded by external incentives and aids.

What, however, is it customary to divide the process of education into these two stages, it must not be forgotten that the underlying motives of self-education—the desire to gain knowledge and to improve character—must be as potent as those of the child's intelligence and will are sufficiently developed to enable it to appreciate and cooperate with the teacher's aims. The child must be able to follow the course of study in later years by the independent exertions of the pupil, just because the desires and aspirations which prompt to and sustain self-education have not been developed. Thus the methods of intellectual instruction adopted have not succeeded in kindling a love of knowledge which would burn on when the years of school were over.

In a certain sense all education is self-education. The acquirement of knowledge is made, the power to use knowledge—to think, to feel, and to will—is developed by, and in proportion to, the activity of one's self. The term, however, is generally applied to some of the different series of the acts of person who, having passed the usual school age, finds himself without the means of external help and guidance, and seeks by his own unaided or but slightly aided exertions to continue or to commence his education.

Now, what is the service which a skillful teacher renders to a learner? He selects the subjects to be studied, and the parts of each subject; and he guides him so that he shall follow part, and subject subject. He chooses the method or manner of study—so that the right faculties shall be exercised—and by his wide knowledge and constant presence he exhibits and maintains a living connectedness not only between the parts of each subject, but also between the subjects themselves. He guides and stimulates the learner to make use of, and to test by use, the knowledge acquired; and is ever on the watch to regulate and direct exertion, to supply explanations where needed, and to recall the learner's attention to any knowledge which seems likely to slip away.

This service of the skilled teacher is of vital importance to the younger beginner; but, except in suggesting connectedness and in general guidance and stimulation, it tends to grow of less and less importance as the learner himself grows in knowledge and in development of power to use knowledge. To one who has been properly educated during the school period it would seem sufficient to give advice, following as nearly as may be the practice of the teacher.

(1) Do not choose too many subjects.  
(2) Select in preference first subjects of which you already know something and which have a bearing of some kind on the work of your everyday life, and then those which are new and out of these.  
(3) Having ascertained from some competent authority the best text-books, seek to master the main points first, and fill in the lesser matters later.

(4) Consistently test your knowledge by employing it in every available way—not only knowledge newly acquired, but also old knowledge with it—and, when the chance offers, test it at times by its amount and readiness also by entering some good public competition.

(5) By every means in your power maintain a connectedness in all that you learn; do not let old knowledge slip away, and always endeavor to gain knowledge by personal experience rather than at second-hand; always try to see how the new knowledge just gained affects what you already know.

(6) Ally yourself with other students when you can, although their subjects may not be yours. What they learn and care about will prove unexpectedly useful to you with regard to your own knowledge; and community in study is always stimulating and refreshing.

(7) Lastly, remember that the best education is one which enables you to live out your

life effectively in many directions, and does not consist in the mere accumulation of facts; it is the result of well mingled knowledge which you know how to employ, and is not the knowledge itself.

A person who has had no school education is now so rare a being that it seems hardly necessary to offer him advice. This, however, may be said: Choose some object of observation such as you have the best means of studying practically; and work from it as a center gradually outward in different directions, never losing the connection with your central subject; observe, classify, experiment, reason, and then again observe.

Your best central subject will be one of the following: botany, natural history, physiography, or perhaps geology, or not at any rate for some considerable time, attempt to make any but your central subject a special study; and follow up your other subjects which branch from it simply for the sake of that central subject.

**Selfishness, Self-Love.**—By self-love or self-regard moralists indicate that instinctive concern for one's own safety and happiness which is common to all men. This feeling has its roots in the impulse of self-preservation which is necessary to the conservation of individual life, and which, in an articulate or an inarticulate form, is an endowment of all sentient creatures. When this feeling exists in moderation, and does not render the subject of it callous to the interests and needs of others, it is spoken of as rational self-love. When, however, it is excessive, leading to an insatiable passion of the thoughts and desires about personal interests and to the disregard of others' happiness, it becomes what we all know as selfishness.

Selfishness is commonly said to be a characteristic of childhood. Children are apt to be greedy, insatiable in their demands, jealous of other children, indifferent to the trouble any cause them, and ungrateful and so forth. Such childish selfishness is to be explained by the circumstance that social feelings are later in development than the egoistic. The appearance of selfishness in a young person arises from a suddenness and weakness of the sympathetic feelings must be distinguished from that more baseful form of egoism which is apt to show itself in certain children later on, and which is based on a preference of self to others. In dealing with the child's egoistic feelings the educator must not seek to uproot them, but, recognizing the valuable and necessary element in them, aim at making this the basis of a reasonable regard for self and a sense of personal worth. The tendency to selfishness must be early corrected, before it hardens into a habit, by drawing out and educating the love and sympathy of the children. If children are selfish they are mostly disposed to be affectionate if only the educator can discover the way of touching and drawing out the love.

**Slater Fund.**—In 1862 Mr. John P. Slater of Concord, N. H., gave to the State of Massachusetts the sum of \$1,000,000, for the purpose of "uplifting the lately emancipated population of the Southern states and their posterity." For this purpose the sum was divided into three parts. The first part of \$300,000 was voted, and a medal was presented. Education in industries and the preparation of teachers are promoted in institutions believed to be on a permanent basis. Schools established by states, denominations, and individuals are helped by annual donations. Among the more prominent are the Hampton normal and industrial school, the Hampton University, Fisk University, Tuskegee institute, and schools at Tougaloo, Miss.; Raleigh, N. C.; New Orleans, etc.

**Smithsonian Institution**, a learned institution in Washington, D. C., established in 1846, "for the increase and diffusion of knowledge among men," by James Smithson, a natural son of Hugh Smithson, first duke of Northumberland, through a bequest of \$515,169, subsequently increased by a legacy left to \$515,169. The legacy, having been bequeathed to the United States,



was formally accepted by Congress, and the institution established by an act approved August 10, 1849.

The government of the institution is intrusted to an establishment consisting of the President of the United States, the Vice-President, the members of the Cabinet, and the Chief Justice, in addition to which there is a Board of Regents composed of the President of the United States, the Chief Justice, three members of the Senate, three of the House of Representatives, and six citizens selected by Congress. The executive officer is the secretary of the institution, who is elected by the regents.

The objects of the institution, as defined in the original plan by the first secretary, are, first, to increase knowledge by original investigation and study in either science or literature; and, second, to diffuse knowledge not only through the United States but everywhere, especially by promoting an interchange of thought among persons prominent in learning in all nations. This general proposition was more specifically defined as follows: "To assist men of science in making original researches, to publish them in a series of volumes, and to give a copy of them to every first-class library of the five parts of the earth." Scientific investigators in the United States, as well as those abroad, have been aided by the institution. Books, apparatus, and laboratory accessories have been supplied to thousands, and a number of money grants have been made. Personal encouragement has been afforded, advice given, and thousands of letters written in response to inquiries.

The publications are numerous and include memoirs on archeology, astronomy, ethnology, botany, zoology, geology, paleontology, meteorology, physics, physiology, and philosophy, and many other branches of investigation.

In 1891 the funds of the institution were increased by a bequest of nearly \$250,000 from Thomas G. Hodgkins, and with other additions, the total permanent fund amounts to \$897,000 deposited in the treasury of the United States. The income is about 6 per cent under special congressional provisions. The institution has its home in a building of Seneca brownstone in the Norman style of architecture, erected on the Mall in 1847-55.

Under the fostering influences of the Smithsonian Institution a number of dependencies have grown up, which are supported by appropriations by Congress, the secretary being the *ex-officio* chief of each. These are:

(1) The *Bureau of Exchanges*, begun in 1850, which has for its object the free interchange of scientific material between scientific institutions, the correspondents of which number upward of 48,000.

(2) The *National Museum*, the depository of the national collections. It is especially rich in the natural history, geology, paleontology, archeology and ethnology of America, and has unique collections of American history, as well as many specimens relating to fine arts and the industrial arts. It is both an educational and a research museum, and issues numerous technical and popular scientific publications. The National Gallery of Art consists largely of the collections of etchings and engravings of George P. Marsh; the collections of Charles L. Freer, containing numerous paintings and etchings by Whistler, and examples of Chinese and Japanese art; the Harriet Lane Johnston collection, including a number of the greatest English portrait painters; and the collection of William T. Evans, of one hundred paintings representing some of the best work of American artists. A new building, for which \$3,500,000 has been appropriated, is in course of construction.

(3) The *Bureau of American Ethnology* is an outgrowth of researches beginning early in the history of the institution, which has from the outset devoted attention to the native American tribes. It began its formal existence in 1879, under the directorship of John W. Powell, who was succeeded in 1902 by William H. Holmes.

(4) The *National Zoological Park* was established in 1890 for the purpose of securing the preservation of such American animals as are upon the verge of extinction. It occupies 167 acres north of the center of the city of Washington.

(5) The *Astrophysical Observatory* was established in 1890 for the purpose of carrying on investigations in astrophysics, especially with regard to the invisible portions of the spectrum of the stars.

**Sympathy** is a feeling with, or a sharing in the feelings of others. Sympathy is a representative feeling, that is, a feeling which depends on the imaginative representation of a state of mind not actually experienced at the moment. As such, it presupposes a certain amount of personal experience of pleasure and pain.

The want of sympathy which is so often ascribed to children is explained by the limitation of their experience, their inability to realize states of feeling different from their own, and their preoccupation with personal interests and pursuits. At the same time, the germ of sympathy, *viz.*, the tendency to reflect others' feelings, is plainly seen in the readiness with which they are excited to laughter or tears by examples and contagion.

This tendency has a high educational importance. It is by the contagious propagation of feeling that the teacher's cheerful manner induces a willingness to learn in the pupil. The advantage of teaching children in numbers rather than alone depends on the sympathy of numbers, which is merely another expression for the capacity for the young to take on the mental attitude of those by whom they are surrounded.

The higher kind of sympathy or fellow-feeling, which implies, not only a sharing in the feelings of others, but an understanding of them as one chief element in moral development. Where there is affection between teacher and pupil, and the disposition to sympathize with the impulses, not only of the child, but of the happiness promoted, but a powerful motive is supplied to effort and industry. The sympathetic child finds it a pleasure to do what the teacher knows to be right, and to do it to do. Hence the importance of the teacher's drawing out the affectionate impulses of the child, by manifesting on his side a loving sympathy and interest in the latter's welfare and happiness.

The impulse of sympathy is, further, that on which the moral educator must ultimately rely for the correction of the selfish propensities of children, as shown in greediness, envy, cruelty, and the bitter feeling of rivalry. Since it is agreed that duty consists essentially in a recognition of the interests and claims of others, it is evident that virtue, or the fixed disposition to the right, must have its chief root in a wide and impartial sympathy. Hence the moral importance of cultivating the sympathetic feeling of children, first of all in relation to their immediate associates, human and animal, and then in relation to wider and wider circles, those of other social grades, other races, and so forth.

**Teachers' Institute**, the name given, in the United States, to a assemblage of teachers of elementary or district schools, called together temporarily for the purpose of receiving professional instruction. Such meetings are held under the direction of the school authorities, usually the state, county, or town superintendent, and quite often there is a provision of law requiring the teachers employed in the common schools to attend, and permitting a continuance of their salaries during the absence.

A teachers' institute is usually conducted by an experienced teacher having special skill for the work. This requires a good knowledge of the practice and theory of teaching, especially as applied to the ordinary branches of common-school education; it also needs ability as a lecturer. Teachers' institutes are designed to be either supplementary, or as complementary to, normal instruction, and as such they constitute a valuable agency in connection with a system of common-school instruction.

**Temper.**—This term, which originally meant a due mixing of elements, refers to the constitution as a habitual disposition of the mind on its emotional side, or to its emotional complexion. Thus we speak of a violent, an irritable, a calm or equable, and a good or cheerful temper.

The difference of temper which characterizes individuals are in part due to physical and constitutional causes. A strong and healthy physique is a basis for a good temper. Disturbances of health affect the temper in all cases, and lasting physical suffering may sour it for life. On the other hand, temper is to a large extent a subject of control by the will. This control grows older and governs our moods by suppressing feelings of annoyance and anger, and also in cultivating a cheerful and hopeful frame of mind.

The educator is concerned with the management of temper both in himself and in his pupils. The art of ruling others presupposes self-government as one of its prime conditions. Anything in the shape of violence or morbid irritability of temper is fatal to the discharge of the teacher's function; for though it is well for the educator on occasion to be angry, and to be so, it must never be carried away by his passion.

The exercise of the child in the government of its temper forms one important part of its early moral education. Since the child is as a rule liable to be overcome by strong passion, and since its will is at first weak in resisting and overcoming this, the parent and the teacher should do the utmost to stimulate it to make an effort to govern its passions. Locke and Rousseau contend passionate crying should be cured by firmly refusing to grant the child's wishes under these circumstances. As the child grows older appeal must be made to its intelligence and its better feelings, in order to induce it to control its feelings of discontent and anger.

**Temperament** is the permanent of a person we understand his natural complexion or bent of mind as fixed by the temperament of the mind. The common division of temperaments is a fourfold:

- (1) Sanguine (full-blooded), warm, impressionable, and changeable in its moods.
- (2) Phlegmatic (with abundance of phlegm), calm, deliberate, and persistent.
- (3) Choleric, with a strong, energetic, and prevailing objective attitude.
- (4) Melancholic (with black bile), sentimental, with tendency to subjectivity.

This fourfold division has been handed down from ancient times, and, as its terminology suggests, is based on a crude and obsolete notion of the physical basis of mental dispositions. Nevertheless it has been used as the starting point in recent attempts to classify the leading facts of temperament.

It is now recognized that the manifold individual differences of mental constitution are very incompletely described by this scheme. Ingenious attempts have been made by recent writers to group these by combining the four leading types in various ways. A truly scientific classification of mental peculiarities must set out the radical psychological distinctions. Thus we have a well marked contrast between temperaments in the emotional or sensitive and the intellectual or objective.

With respect to the precise physiological basis of these differences science is as yet able to tell us very little. We know that intellectual differences, as in respect of the power of discrimination, or of vividness and revivability of impressions, are connected with peculiarities of the brain and sense organs. We also know that the emotional or sensitive temperament is correlated with special vigor of the muscular system and the motor side of the nervous system as a whole. A thorough understanding of the leading types of natural disposition, with their physical counterparts, is greatly needed by the educator as an aid to an intelligent classification.

**Truthfulness, Untruthfulness.**—Truthfulness or veracity has been regarded by moralists generally as one of the cardinal virtues. A scrupulous truthfulness, including the abhorrence of a lie, is one of the highest

results of moral education. Lying is a common vice among children, as it is among backward races of mankind. It is very doubtful, however, whether it is a natural propensity which tends to display itself in all cases independently of circumstances.

Much of childish inaccuracy of statement is not, strictly speaking, untruthfulness—that is, conscious falsehood—but is explained as the result of imperfect knowledge of words, and of a vivid imagination which momentarily confuses fiction and reality. A child properly brought up seems rather to show an instinctive shrinking from falsehood, and only lies as the result of an effort.

The habit of untruthfulness may be induced not only by the bad example of untruthful companions, but by errors on the part of the parent or preceptor. Thus, want of strict accuracy from a polite wish to please others may first suggest untruth to the child's mind. Again, a child may be wrongly and foolishly accused of lying, and so the idea of falsehood be forced on its attention. For the most part, the educator should be careful not to force and hurry a child into lying, when the temptation is great and likely to be overpowering, and especially not to terrify a child into untruth, but to encourage it to be perfectly open, even when it is likely to confess. When a lie has been clearly detected, it is a proper subject for punishment, and care must be taken to make this adequate, as to correct the weakening effect of the first lie on the habit of truthfulness. Here, however, care is necessary.

Lies differ greatly in turpitude according to their motive, and the list that springs from fear of punishment ought not to be viewed as heavily as one arising from a desire to gain an advantage over another, to involve another in trouble, and so forth. Much care should be taken by the mother not only in her own use of words, but in the selection of companions, so as to accustom the little one at the outset to the habit of truth, as something normal and admitting of no exception; and as the child grows, to desire of the home, the school, and of the playground should combine to develop a feeling of hatred and contempt for falsehood as something essentially mean and cowardly.

**University**, a corporate body or corporation established for the purposes of instruction in all or some of the most important branches of literature and science, and having the power of conferring certain honorary dignities, termed *degrees*, in several faculties, as arts, medicine, law, and theology. In most cases the corporations constituting universities include a body of teachers or professors for giving instruction to students; but this is not absolutely essential to a university, and London University, for instance, was long merely an examining body.

In the middle ages, when the term began to be used in reference to seminaries of learning, it denoted either a body of teachers and learners, or the whole body of learners, with corporate rights and under by-laws of their own, divided either according to the faculty to which they were attached, or according to the country to which they belonged.

At a later period the expression *universitas literarum* (the whole of literature or learning) was used to indicate that all the most important branches of knowledge were to be taught in these establishments, and in some, forming the notion of a university from the universities of Oxford and Cambridge, suppose that it necessarily means a collection and union of colleges, that it is a great corporation, comprising in one certain smaller and subordinate collegiate bodies; but this is not correct, for many universities exist in which there are no colleges. This is the case with most of the German universities, and in these and such universities there are no foundations which bear any resemblance to the English colleges.

Oxford and Cambridge differ from most universities also in the fact that, though they possess a body of professors, little of the teaching falls to be done by these. The oldest of the European universities were those of Bologna and Paris, and these formed the models

on which most of the other early universities were established, a papal bull being generally regarded as necessary to this.

The United States possesses the largest number of institutions bearing the name of universities, but a large proportion are sectarian, and many represent only a single faculty.

**University Extension** is the offering of a systematic course of instruction by a limitation of higher learning through its professors to audience and classes beyond the local bounds of the university itself. This idea of popular education, through the agency of university professors using university methods seems first to have taken root on English soil in the University of Cambridge in 1872.

The plan, however, did not spring from the university, but was rather originated by certain mechanics, institutes in the manufacturing towns of Leeds, Birmingham, and Nottingham, which presented memorials to Cambridge, requesting that university to offer instruction in those towns for the benefit of working men. In accordance with this request, the University of Cambridge offered courses of lectures in three different centers in the following year, 1873. The plan was popular in England from the first, and the work has constantly grown in importance ever since.

Though the work was begun in a somewhat haphazard way, the experience of the first few years shaped a well established university extension method, which has continued with slight modification even to the present day. The method involved:

(1) An extension center, under local management, whose function it was to secure a local body of students, provide suitable rooms, guarantee expenses, etc.

(2) A course of lectures by a university instructor, the standard being a course of either six or twelve lectures, according to circumstances. The instructor provided printed copies of his lectures for the use of his students.

(3) Libraries embracing the necessary books for the use of students in the class were provided either by the local center or by the university.

(4) A public session, in which the lecture was delivered to the general audience, immediately followed by a session for the benefit of the students, was pursued with great intensity, at which opportunity for questions and discussion of the lecture was given.

(5) Theses, weekly or at some other stated interval, written by the class upon topics proposed by the instructor, and corrected by him.

(6) A written examination, participated in by those who desired to obtain a certificate of credit for the successful completion of the course.

The extension of popular education through systematic lecture courses was not inaugurated in the United States by any college or university. Its first public advocacy seems to have been made by the late Professor Herbert B. Adams, of Johns Hopkins University, before the American Library Association, in 1887. Three years later, in the fall of 1890, the first organized movement toward the realization of these plans was made by the organization in Philadelphia of the American Society for the Extension of University Teaching.

In 1892, with the opening of the University of Chicago, a University Extension Department was established as an integral part of the university, with an office secretary and a select staff of lecturers whose entire time was devoted to the work of lecturing. Here was the first university extension, in the strict sense, in the United States, corresponding to the type developed in Cambridge and Oxford—that is, a university officially undertaking to extend its instruction beyond its own walls.

The example of Chicago has been followed by other universities in the United States, notably by Columbia, University of Wisconsin, Pennsylvania State College, and the University of Wisconsin.

**Vanity, Pride, Self Esteem**.—These terms refer to varieties of feeling which have a common root in self-love and self-regard. The

child instinctively attaches a value to all that concerns itself, and when a distinct consciousness of self is developed this instinctive disposition passes into a sense of self-love or self-attention, which is analogous to its love for others. At first, owing to the weakness of their judgment, children are disposed to estimate themselves and their actions by the opinion of others. Self-regard is at this period largely the reflection of others' complacency.

The most general name for this dependence on others' approval is the love of approbation. It is at once the source of one of the most valuable motives of childhood and of one of its greatest weaknesses. Kept within proper bounds, and rendered intelligent and discriminating, this regard for others' opinion is one of the educator's principal aids. On the other hand, when unchecked and undiscriminating, it grows into a foolish and hurtful vanity; or love of admiration. Vanity involves an excessive self-consciousness, an over estimate of some personal quality, as good looks, and a too eager desire for others' admiration. This vanity is one of the most conspicuous in ambition and thirst for glory, though here another impulse, viz., emulation, cooperates.

A child must be cured of vanity by withdrawing all inordinate praise; by associating it with the faults of others, that they may learn its defects and points of inferiority; by cultivating its affections and its intelligence, and so developing a certain selectiveness in the enjoyment of praise, and a power of discriminating empty flattery from just recognition of worth; and, finally, by exercising and strengthening it in self-judgment and self-esteem.

As the child grows to the age of independence it must learn to rely less on others' good opinion and more on its own. This self-esteem is necessary to the higher development of the child, and the educator chooses right independently of the value set on it by others, implies that the subject finds an adequate reward in the feeling of self-approbation. A proper feeling of self-respect, or pride, which leads to self-respect, is small, mean, and tricky as unworthy of him, or beneath his dignity, is one of the most valuable of moral safeguards. In encouraging this self-esteem and this sense of personal dignity the educator must be careful not to foster an excessive and cynical disregard for others' approval, which is a blemish in all cases, and in the case of the young is particularly baneful.

**Voice**, the name given to the result of the production of sound in nearly all higher vertebrate animals. Speech is a modification of "voice."

In the man the voice is produced by the *inferior laryngeal ligaments*, or *true vocal cords*, as they are termed. The vocal cords consist of two elastic folds of mucous membrane, so attached to the cartilages of the larynx as to be drawn together by the contraction of relaxed or otherwise altered so as to modify the sounds produced by the vibration. The higher the note produced the greater is the tension of the cords; the range of voice therefore depends upon the amount of tension which the cords can undergo.

From the age of six until nearing the period of puberty the larynx is approximately similar in size in both sexes; but in adults the larynx is about a third larger in males than in females, and the male voice is generally an octave lower in pitch than the female.

Regarding the compass and application of the voice in speaking and singing, physiologists have noted three kinds of sequence. In ordinary speaking a monotonous sequence is observed, the notes having nearly all the same pitch, and the variety of the sounds being about a third larger in males than in females. This is due to definite movements of the glottis and vocal cords.

A passage from high to low notes, without interval, forming second kind of sequence, or the same sequence is observed in the passage from low to high notes. Such a sequence is exemplified in crying and howling both in man and in lower animals.





# ARTS AND SCIENCES



**HISTORY.** Universal history is usually treated in three principal divisions:

**I. Ancient History**, which begins with the earliest written records and terminates A. D. 476, with the destruction of the Roman empire.

**II. The Middle Ages**, which extend from the fall of Rome, A. D. 476, to the discovery of America, A. D. 1492.

**III. Modern History**, which commences at the latter epoch, and continues to the present time.

The events which mark the separation between the *first* and *second* periods, are the irruption of the Teutonic tribes, the consequent fall of the western Roman empire, and the foundation of the modern European states; between the *second* and *third*, are the extension of learning by the invention of printing, the taking of Constantinople, the maritime discoveries of Spain, Portugal, and other European countries, with the more extensive use of firearms.

**I. Ancient History** may be subdivided into six periods:

1. The nebulous period, comprising the fragmentary accounts of the early Assyrians, Babylonians, Egyptians and Hebrews, down to 2000 B. C.

2. The Mosaic period, from the time of Abraham to 1200 B. C., during which Moses promulgated his great code of moral and political laws.

3. The Assyrian-Babylonian period, which witnessed a long series of Assyrian conquests, the zenith of Babylonia, the rise of Greece and Rome, and the foundation of the Persian empire,—1200 to 529 B. C.

4. The Persian-Macedonian period, from 529 to 323 B. C., during which both the Persians and the Greeks reached their greatest achievements.

5. The Greek-Roman period, from 323 B. C. to the Christian era, saw the decline of the Greeks and the coming universal power of the Romans.

6. The period of the Roman empire, from the time of Christ to 476 A. D., was notable for the foundation of Christianity, Christian persecutions, the division of the empire, Roman luxury and corruptions, and the incursion of the Teutonic hordes.

**II. The Middle Ages** may be treated in the following six periods:

1. *First*, the foundation of the modern states of western Europe, A. D. 476–622, when the Saxons invaded Britain, A. D. 449; the Visigoths settled in Spain, A. D. 507; the Ostrogoths in Italy, A. D. 489; and the Franks began the formation of the French monarchy, A. D. 481.

2. The *second* comprehends the age of Mohammed, with the propagation of his creed, and the establishment of the states which embraced his religion, to the treaty of Verdun, A. D. 622–843.

3. The *third* embraces the period from the treaty of Verdun, when the empire of the West was divided, to the Dark Ages, 843–936.

4. The *fourth* is the interesting period of the Dark Ages, A. D. 936–1096, during which the monarchy of Charlemagne fell to ruin, the Capetian dynasty began to reign in France, Italy was parceled out among a number of petty princes, while in Germany, Otto commenced the long-continued struggle against feudalism.

5. The *fifth* is the romantic or heroic period of the Crusades, A. D. 1096–1273, in which the Roman legal code, the foundation of modern jurisprudence, began to be studied.

6. The *sixth*, from 1273 to 1492, beheld the revival of the fine arts in Italy, the taking of Constantinople and diffusion of its learned men, the revival of letters, the discovery of America, A. D. 1492.

**III. Modern History** falls conveniently into five periods:

1. The period of the Reformation, including its commencement by Luther, A. D. 1517, till the termination of the long series of religious wars, by the treaty of Westphalia in 1648. This period produced many important changes in Europe.

2. The period from 1648 to the death of Louis XIV., in 1715, during which Russia entered European politics, and Great Britain began to assume large influence on the Continent.

3. The period from the death of Louis XIV. to the Congress of Vienna, 1815, which marked the fall of Napoleon. In this period was established the independence of the United States, Prussia advanced to the front rank of European powers, the French Revolution occurred, and the world witnessed the rise and fall of Napoleon.

4. From the Congress of Vienna, 1815, to the American Civil war, the most momentous period in American history.

5. From the close of the American Civil war to the present time, a period of unprecedented development and expansion.

## PARALLEL OUTLINES OF UNIVERSAL HISTORY

### FROM THE DAWN OF HISTORY TO THE TIME OF ABRAHAM, B. C. X-2000 (?)

CHARACTERISTICS OF THE CENTURIES	BABYLONIA—ASSYRIA	EGYPT	ARTS AND SCIENCES	LITERATURE
<b>B. C. 5000—4000</b>  Modern research shows the existence of flourishing city states in the Mesopotamian region, whose origin and growth far antedate this period. Early Babylonian and Egyptian civilisation.	5000 (?) Kengi, or Sumerians, seem to be the advance guard of Babylonian civilisation.  4500 (?) Struggles for mastery among petty Babylonian Kings. Kingdom of Shurpura dominates, with Sungir (Shinar) as its capital.  4100 (?) Dynasty of Eresh begins about this time.	5000 (?) Tombs of pre-dynastic Kings at Abydos reveal an advanced state of civilisation.  4400 (?) Menes founds the old Egyptian empire, Memphis, the capital. Animal worship becomes prominent in Egyptian life.	5000 (?) At this date many of the industrial arts had made considerable advancement both in Babylonia and Egypt.  4100 (?) Architecture in stone begun in Egypt; copper tools introduced, and artsmanship fostered.	
<b>B. C. 4000—3000</b>  Period of the pyramid builders. The Accadians flourish in the Euphrates valley.	4000 (?) Nippur becomes the religious center.  3900 (?) Agade becomes the chief center of Northern Babylonia. 3800 (?) Sargon I. of Accad, reached the Mediterranean, and conquered Elam, a kingdom east of Babylonia. 3700 (?) Babylon made capital.  3200 (?) End of the dynasty of Sargon.	4000 (?) Athothia, King.  3753 (?) Khufu (Cheops) builder of the great pyramid, reigns.  3666 (?) Khafra (Chefnen), pyramid builder, reigns. 3633 (?) Menkaura (Mykerinos), pyramid builder, reigns. (Egyptian history almost a blank until the 11th dynasty.)	3000 (?) Great Pyramid at Gizeh. The Sphinx carved.  3750 (?) Temples to the gods built by Sargon I. at Nippur and Agade.  3300 (?) Canals and irrigation in Egypt begun.	"Moral Precepts" of Ptah-hotep.

## FROM THE DAWN OF HISTORY TO THE TIME OF ABRAHAM, B. C. X-2000 (?)—Continued

CHARACTERISTICS OF THE CENTURIES	BABYLONIA—ASSYRIA	EGYPT	ARTS AND SCIENCES	LITERATURE
<b>B. C. 3000—2000</b>  Invasions of Accad and Babylonia by the Kings of Ur and the Elamites, respectively. Babylonian dominions extended. First migrations from the Aryan center; Celts move westward; Indo-Persia tribes, south. Chinese civilization evident. Flood narratives accepted, and Sabbath observed among Semites.	3000 (?) Accad under Kings of Ur.  2500 (?) Isin takes high rank among Babylonian cities, and a dynasty is founded there.  2450 (?) Arabians and Elamites erupt into Babylonia.  2400 (?) City of Babylon first rises into prominence. 2300 (?) Elam supreme in Babylonia.  2300-2250 (?) Hammurabi unites Babylonia.	3000 (?) Hierakleopolis becomes the seat of government.  2800 (?) Amenemhat I., first of the 12th dynasty.  2650 (?) Usermonte III., King, conducts expedition against Ethiopia.  2400 (?) Government moved to Thebes.  2100. Egypt conquered by the Hyksos, or Shepherd Kings.	3000 (?) Era of palace and temple building renewed in Babylonia; statues of Gudea.  2750 (?) Temple at Heliopolis built; also temple of Ostris at Abydos.  2371-25. Egyptian obelisks erected. 2300 (?) Amenemhat III. constructs Lake Maria, and the labyrinth near it. 2200. Astronomy known in Chaldaea.	Inscription of Una, found at Abydos. <i>Egyptian Book of the Dead.</i>  <i>Code of Hammurabi.</i>

## FROM ABRAHAM TO THE PERIOD OF ASSYRIAN ASCENDENCY, B. C. 2000-1200.

CHARACTERISTICS OF THE CENTURIES	HEBREWS	BABYLONIA—ASSYRIA	EGYPT	EUROPE	ARTS AND SCIENCES	LITERATURE
<b>B. C. 2000—1200</b>  Egyptian revolt from the Shepherd Kings. New Egyptian empire.  Rise of Assyria—originally settled by emigrants from Babylonia. Wars with Babylonia.  Sidon, a Phœnician city, at its zenith. Phœnician colonies established round the Mediterranean.  Advanced civilization in Crete.  Exodus of the Hebrews from Egypt under Moses.  Hittites rise to great power, contending equally with Egypt and Assyria.	2000(?) Abraham, Hebrew patriarch.  1728 (?) Joseph, Migration of the Hebrews into Egypt.  1491 (?) Moses; Exodus from Egypt.  1451 (?) Hebrews conquer the promised land, Canaan. Hebrew theocracy established.  1220. Assyria again independent.	2000 (?) Kamites (Arabians) conquer Babylonia. 1900. Assyria settled by Babylonian emigrants. Nineveh made the capital. 1700. Phœnicia conquered by Egypt.  1600. Long series of wars begun between Babylonia and Assyria.  1310. Tiglath-Adar I. conquers Babylonia. 1200 (?) Salmanser I. rules in Assyria.	(Period of great obscurity.)  1800 (?) Revolt of Thebes against the Hyksos.  1670. New Empire expands under Thothmes III.; Phœnicia, Persia and part of Asia Minor conquered. 1524-1488. Expeditions against Syrians and Ethiopians, under Seti I. 1500. Egyptus reigns, and gives his name to the country.  1333. Ramses II. wages war against the Hittites; oppresses the Hebrews. 1322. Memphis, the supposed Pharaoh of the Exodus.  1260. Ramses III.  1244-1091. Decay of the Empire under the Ramses Pharaohs.  1200. Priam, King of Troy. 1216. Second Theban war. 1213. Helen (later of Troy), carried off by Theseus, afterward married Menelaus.	2000. Celts reached western Europe. Principal settlements made in central France.  1700. Arcadians migrate to Italy.  1582. Earliest date in the Persian chronicles of Greece, preserved in the Arundelian marbles. 1504. Areopagus established.  1457. Kingdom of Mycenae founded. 1433. First Olympic games at Elis. 1400. Minos reigns in Crete.  1384. Founding of Corinth.  1356. Eleusinian mysteries instituted by Eumolpus.  1266. Edipus, King of Thebes. 1263. Argonautic expedition of Jason.  1240. Troy taken by the Argonauts. 1239. Latinus reigns in Italy. 1235. Theseus reigns in Athens for 30 years. 1233. Carthage founded by the Tyrians. 1225. First Theban war. 1220. Priam, King of Troy. 1216. Second Theban war. 1213. Helen (later of Troy), carried off by Theseus, afterward married Menelaus.	2000. Babylonian industry flourishes under the Kamite kings. Phœnicians skilled artisans.  1650. Library founded at Thebes; manuscripts transcribed.  1524-1488. Magnificent palaces and temples erected at Thebes.  1400. Babylonian language in commercial use among eastern Mediterranean countries. 1338-1322. Ramses II. builds many palaces and temples in Egypt. 1370. Bucklers used in single combat. Music and poetry cultivated in Greece.  1263. Temple of Apollo at Delphi built. Jason leads first naval expedition on record. 1240. The ax, wedge, gimble, and lever, also masts and sails for ships, invented by Dedalus of Athens.  1224. Game of backgammon invented by Palamedes, of Greece.	<i>Pentecost, a descriptive poem, in epic form.</i> <i>Thothmes III. causes chronology of Egyptian kings to be made.</i> <i>Papyrus Herodotus.</i>  <i>The Vedas of India.</i>  <i>The Amarna Letters.</i>  <i>Chinese Book of Changes.</i>

THE ASSYRIAN-BABYLONIAN PERIOD, B. C. 1200-529

CHARACTERISTICS OF THE CENTURIES	THE HEBREWS	ASIA AND AFRICA	EUROPE	ARTS AND SCIENCES	LITERATURE
<b>B. C. 1200—1000</b>					
Heroic age of Greece; Hebrews reach their highest point of national power. Beginning of the Medo-Persian nations. Celts disperse over western Europe and into British Isles.	1161. Israel enslaved by the Philistines. Samson born. 1136. Samson slays 1,000 Philistines.  1116. Samuel, last Judge of Israel.  1065. Saul becomes King of Israel. 1055. David born.  1055. Death of Saul; accession of David. 1048. David, King of all Israel.  1042. The Ark removed to Jerusalem. 1039. Revolt of Abalom. 1033. Solomon born. 1016. Death of David. 1015. Solomon ascended King. 1012. Solomon begins the Temple. 1004. Dedication of Temple.	1194. Trojan war. 1184. Troy taken.  1140. Tiglath-Pileser real founder of the Assyrian empire. 1133. Chou dynasty begins in China.    1044. Ionian emigrants settle in Asia Minor.  1000. Solomon and Hiram, King of Tyre, form an alliance; also Solomon and Pharaoh. 986. Utiaca built. Samsu built.	1132. Alba Longa built by Ascanius.  1124. Æolian migration. Thebes capital of Boeotia founded. 1104. Return of the Heracleidae. End of the Kingdom of Mycenae.  1070. Heremom, of Galicia, conquers Ireland. 1060. Athens governed by Archons.	1115. Mariner's compass known in China.       1015. Minos gives Crete his code of laws. 1000. Solomon extends his commerce to India; builds Palmyra, Haulbe, and other cities.	Dictionary of Chinese completed by Fe-o-tse.
<b>B. C. 1000—800</b>					
Homeric age. Celts already in Britain, with bronze in use. Phœnician trade extended from Senegal to India. Temporary decline of Assyria.	<b>JUDAH</b>  971. Shishak, King of Egypt, takes Jerusalem.    888. Philistines plunder Jerusalem.  884. Uprising and death of Athaliah.	<b>ISRAEL</b>  975. Jeroboam establishes idolatry.  918. Ahab and Jezebel. 901. The Syrians besiege Samaria. 898. Elijah translated to heaven.  884. Jehu, King.  840. Jehoshaphat defeats King Benhadad of Syria.   770. Pul invades Israel, and is bribed to depart.    721. Samsar taken by the Assyrians; Ten Tribes carried into captivity.	976. Cypria reigns in Alba Longa.  938. Bacehus, King of Corinth.  898. Tiberinus, King of Alba, drowned in the river Albula, which is thereafter called the Tiber.  864. Romulus, King of Alba Longa.  814. The Kingdom of Macedonia founded by Caranus.  769. Syracuse founded by Archias of Corinth. 753. Building of Rome. 750. Sabine war. 747. Union of Romans and Sabines. 743. First Messinian war.	975. Death of Solomon. Revolt of the Ten Tribes. Two kingdoms formed.  918. The Rhodians begin navigation laws.  884. Lycurgus reforms the constitution of Sparta. 869. Gold and silver coined by Phidon, ruler of Argos.	Homer, Greek poet.       Homer's poems brought into Greece.
<b>B. C. 800—700</b>					
Ethiopian supremacy in Egypt. Assyrian conquests continue; Tiglath-Pileser III.; Sargon; Babylonia rises to height of its power.	741. Pekah, King of Israel, besieges Jerusalem; 120,000 of his men slain.  726. Hezekiah abolishes idolatry.          <b>HEBREWS</b>  717. Hezekiah, King. 712. Sennacherib invades Judah. 711. His army (185,000) destroyed by pestilence.  696. Manasseh, King.	<b>BABYLONIA</b> 737. Sennacherib invades Egypt. 736. Tiglath-Pileser III. conquers Syria and part of Israel. 721. Sennacherib, King of Babylonia, takes Samaria and carries the remainder of the Ten Tribes into captivity.  710. Media becomes a kingdom.	718. Romulus reputed murdered.	710. Roman calendar reformed; year divided into 12 months instead of 10, as before.	Greek lyric poetry flourishes.

## THE ASSYRIAN-BABYLONIAN PERIOD, B. C. 1200-529—Continued

CHARACTERISTICS OF THE CENTURIES	HEBREWS	BABYLONIA	EGYPT	EUROPE	ASTR. SCIENCES, ETC.	LITERATURE
<b>B. C. 700-600</b>  Zenith and fall of Nineveh, and Assyrian empire. Media rises to power. Perhaps last migrations from the Aryan center—Teutonic and Slav races.	677. Manasseh, carried to Babylon, is afterward restored.	680. Babylon and Nineveh are united under Esarhaddon.		685. Second Median War. 678. Argæus, first King of Macedonia. 672. Tullius Hostilius, King of Rome. 664. First sea-fight on record—between the Corinthians and Ceryneans. 658. Hyphantium founded.	680. Chess invented.	Iambic verse introduced.
		48. Sarracus, King of Babylon and Nineveh.	660. Psammethichus, King of Egypt. Memphis becomes the capital.	640. Latins conquered by the Romans. Philip I., King of Macedonia.	640. Spherical form of the earth and true cause of lunar eclipses taught by Thales. 631. Draconian code formulated.	Attempt to discover the primitive language of mankind.
	606. Conquest of Jerusalem by Nebuchadnezzar.	612. Nineveh a second time destroyed. 606. Nebuchadnezzar defeats Necho of Egypt, takes Judea and takes Jerusalem. 604. Nebuchadnezzar, King of Babylon. 599. Birth of Cyrus.	610. Pharaoh-Necho, King of Egypt. 600. Psammis, King of Egypt. 594. Pharaoh-Hophra (Apries), King of Egypt. 581. Egypt invaded by Nebuchadnezzar.	616. Tarquinius Priscus, King of Rome. 602. Illyria conquered by Macedonia. 594. Solon, Archon of Athens.	610. Pharaoh-Necho begins a canal between the Mediterranean and Red Sea. Many lives lost in the attempt. He also sent out a Phœnician fleet which circumnavigated Africa. 594. Solon's code supersedes that of Draco at Athens.	Alcæus and Sappho, Greek poets.
<b>B. C. 600-500</b>  Zenith and fall of Babylon. Long reign of Nebuchadnezzar; he ravages Egypt. The seventy years' captivity of Judah. Rise of Persia.	591. Ezekiel prophesies to Chaldees. 589. Captivity of Judah completed; Jerusalem destroyed, Temple burnt. 579. Jews carried to Babylon.	589. Invades Phœnicia. 572. Takes Tyre.	569. Amasis, King of Egypt, makes alliance with Greece.	578. Servius Tullius, King of Rome. 567. Conquest of Etruria by Rome. 565. First census of Rome: 64,700 citizens. 550. The Phœnicians emigrate to Gaul and build Massilia (now Marseilles).	578. Money coined at Rome by Servius Tullius.	Poems of Anacreon.
	<b>PERSIA</b> 560. Cyrus, King of Persia. 549. Cyrus conquers Babylon. 538. Takes Babylon.  536. Persian empire composed of Assyria, Media, and Persia. Captivity of the Jews ended. 529. Temple rebuilt at Jerusalem. 529. Death of Cyrus; Cambyses, King of Persia.	562. Croesus, King of Lydia, subjects Asia Minor.  538. Babylon taken by Cyrus the Persian.	536. Pythagoras visits Egypt. 535. Made tributary by Cyrus.	528. Thrace comes into view.		

## THE PERSIAN-MACEDONIAN PERIOD, B. C. 529-323

CHARACTERISTICS OF THE CENTURIES	PERSIA	GREECE	MACEDONIA	ROME, ETC.	ASTR. SCIENCES, ETC.	LITERATURE
<b>B. C. 600-500 Continued</b>         <b>B. C. 500-400</b>  Zenith of Persia; and the glorious century of Greece. Struggles of Patricians and Plebeians at Rome.	528. Cambyses conquers Egypt and makes it a Persian province. Psammethichus, last King of Egypt. 521. Darius I., King of Persia. 508. Darius conquers India.  500. The Ionians revolt and burn Sardis. 490. Darius sends an army of 500,000 into Greece. 487. Egypt revolts, and is subdued by Artaxerxes. 485. Xerxes, King of Persia.	527. Pisistratus dies, after seizing Athens.  510. Followers of Pisistratus expelled; Democracy established at Athens.  490. Battle of Marathon.  483. Aristides banished.	497. Alexander I., King.	530. Cadiz built by the Carthaginians.  509. The Tarquins expelled from Rome. Brutus and Collatinus first Consuls. 507. The Capitol finished. 494. Tribunes of the people chosen. 491. Coriolanus banished.	First public library founded at Athens.  Abolition of regal government at Rome, and establishment of a republic. Phœnician letters carried to Ireland from Spain. The Temple of Minerva built.  Etruscans excel in music, drama, and architecture.	Confucius, the Chinese philosopher.  Pindar, the greatest of the Greek lyric poets.  Æschylus, Sophocles.

## THE PERSIAN-MACEDONIAN PERIOD—Continued

CHARACTERISTICS OF THE CENTURIES	PERSIA, ETC.	GREECE	MACEDONIA	ROME, ETC.	ARTS, SCIENCES, ETC.	LITERATURE
<b>B. C. 500—400 Continued</b>	481. Expedition of Xerxes into Greece; destroys Athens.	480. Battle of Thermopylae. Battle of Salamis and defeat of Persians.		480. Carthaginians defeated. Hamilcar killed in battle.		
	479. Returns defeated.	479. Battle of Platea; Persian fleet destroyed at Mycale.				
	465. Xerxes assassinated. Artaxerxes I., King.	476. Themistocles rebuilds Athens.		460. Cimonianus, Consul.	Voyage of the Carthaginians to Britain for tin.	Euripides, writer of tragedies.
	450. Esther.	461. Pericles impresses himself upon Grecian affairs.		456. Cimonianus, Dictator.		Aristophanes, the ablest writer of Greek comedy.
	440. Persians defeated at Salamis.	457. Long walls of Athens begun.		451. Laws of the 12 tables.		
	445. Jerusalem rebuilt by Nehemiah.				441. The battering ram invented.	
	440. Siege of Samos by Pericles	431. Peloponnesian War.				
		429. Death of Pericles, having governed Athens 40 years.				
		418. War with Sicily.				
		411. Athens governed by the "400."	413. Archelaus, "Patron of Learning," seizes the throne.	413. Egypt regains independence.		Plato, the greatest of the Athenian philosophers.
<b>B. C. 400—300</b>		408. Capture of Byzantium.		411. Roman famine.		
	401. Cyrus the Younger defeated. Retreat of the 10,000 under Xenophon.			407. Carthaginians war on Sicily.		
	400. Delhi founded.					
		400. Return of the 10,000.	399. Archelaus murdered.		399. Catapults invented by Dionysius.	
			392. The Illyrians invade Macedonia, and possess the throne.	390. Rome destroyed by the Gauls.		
	387. Greek cities of Asia made tributary to Persia.			378. War between patricians and plebeians. Lucius Sextus, first plebeian Consul.	380. Treatise on conic sections by Aristmus.	Aristotle, the founder of the Peripatetic school of philosophy.
		370. Predominance of Thebes.		371. Curule magistrates appointed.		
				369. Military tribunes abolished.		
		360. War of the Allies against Athens. Decline of Grecian republics.	360. Philip II., King; institutes the Macedonian phalanx; defeats Athenians.		368. A celestial globe brought into Greece from Egypt.	Xenophon, an Athenian historian.
		356. Second Sacred War.	356. Philip II. conquers Thrac and Illyria. Birth of Alexander the Great.		360. Philip II. delivers.	
		344. Philip subdues Sparta. Aristotle visits Mitylene.	341. War against the Athenians. Siege of Byzantium.	343. Samnian war, continued 53 years.		Orations of Demosthenes and Aeschines delivered.
	338. Royal family destroyed with poison.	339. War with Macedonia.	338. Athenians and Thebans defeated at Cheronæa. Philip master of Greece.	340. War with the Latins.		
			336. Philip assassinated by Pausanias; Alexander III., surnamed the Great, succeeds to the throne.	337. First plebeian Praetor.		Aristotle begins his philosophical works.
	336. Darius III., King.		335. Eastern Greece, conquers Greeks, and succeeds to head of army against Persians.		336. Eclipse calculated by Calippus the Athenian.	
		335. Greeks conquered by Alexander the Great. Thebes destroyed.	334. Invades Persia. Defeats Persians at the Granicus.		335. Caustic art invented.	
	334. Alexander the Great invades Persia. (See under Macedonia.)		333. Battle of Issus.	332. Caledonian monarchy (Scotland) founded by Fergus I. Roman treaty with Alexander the Great.		
		332. Egypt conquered by Alexander, and Alexandria built.	332. Ptolemy I. restores the independence of Egypt.	327. Second Samnite war.		
	331. Battle of Arbela. Darius III. murdered. Alexander founds the Grecian or Macedonian monarchy.	330. Aeschines, the orator, banished.				328. Voyage of Nearchus from the Indus to the Euphrates.
		327. Alexander invades India.				
		325. Demosthenes banished.				
Alexander the Great dies in Babylonia. The Grecian cities revolt from Macedonia, and in 321 Antipater becomes Regent of Greece. Persia was reconquered from the Greeks, and remained tributary to Parthia till about A. D. 250.						





## THE GREEK-ROMAN PERIOD—Continued

CHARACTERISTICS OF THE CENTURIES	ROME, ETC.	MACEDONIA	GREECE	SYRIA, JUDEA	EGYPT CARTHAGE	ARTS, SCIENCES, ETC.	LITERATURE
<b>B. C. 200—100</b>	200. Second Macedonian war.	199. Second war with Rome.	198. Achæans and Spartans join the Romans against Macedon.	198. Jews assist Antiochus in expelling the Egyptian troops from Jerusalem. 199. Hannibal joins Antiochus. 190. Scipio Asiaticus defeats Antiochus at Magnesia. 187. Antiochus killed. Syria becomes temporarily a Roman province. 185. Seleucus V., King.	198. Egypt loses her Syrian possessions.  180. Ptolemy Philometor, King. 174. Cato's embassy to Carthage.	198. Books, with leaves of vellum, introduced by Attalus, King of Pergamus.	Polybius, one of the most important Greek historians.
Greece, Macedonia, Carthage, and Spain under Roman rule; decline of the Roman oligarchy; the Gracchi begin the democratic revolution which ends in the empire. Eastern luxury introduced among the Romans.	188. Syria is made a Roman province.  181. Plague at Rome.  170. Tiberius and Caius Gracchus. 167. Census of Rome, 327,000 citizens.  155. Romans unsuccessful in Spain.  149. Third Punic war. Conquest of Carthage and of Corioth. Greece annexed to the Roman empire.	171. Third War with Rome. 168. Macedon becomes a Roman province.  165. Romans enter Achaia.  146. Corioth destroyed by the Romans. Greece becomes a Roman province under the name Achaia.  134. Invasion of Judæa.	172. Antiochus IV., King. Greatly hated by the Jews. 170. Jerusalem plundered by Antiochus Epiphanes. 165. Judas Maccabeus expels the Syrians. 161. Treaty with the Romans.  142. Antiochus VI., King. 134. Invasion of Judæa.	162. Mantineia defeats the Carthaginians. 151. Johnstrig of Philometer and Ptolemy in Egypt. 146. Carthage taken and destroyed by the Romans. 145. Ptolemy Ptolemy becomes sole King of Egypt.	152. Mantineia defeats the Carthaginians. 151. Johnstrig of Philometer and Ptolemy in Egypt. 146. Carthage taken and destroyed by the Romans. 145. Ptolemy Ptolemy becomes sole King of Egypt.	170. Paper invented in China.  162. Hipparchus fixes the first degree of longitude and latitude; founds trigonometry. 150. Clepnydra invented by Scipio Nasica.  146. Alexandria the center of commerce.	Plautus, <i>Comedies</i> ; <i>Amularia</i> , <i>Capituli</i> , <i>Pseudolus</i> , etc.  First library opened in Rome.
<b>B. C. 100—1 A. D.</b>	104. Teutonic defeat 80,000 Romans on banks of the Rhone. 99. Birth of Julius Cæsar.	123. Caius Gracchus, Tribune.  113. First great migration of the German nations.	105. War with Egypt.	130. John Hyrcanus delivers Judæa from Syria. 130. Conquered by Parthia.  129. Ptolemy driven from his throne for cruelty. 128. Pestilence in Egypt. 123. Carthage rebuilt. 116. Ptolemy Lathyrus, King of Egypt. 107. Alexander I., King of Egypt.	129. Ptolemy driven from his throne for cruelty. 128. Pestilence in Egypt. 123. Carthage rebuilt. 116. Ptolemy Lathyrus, King of Egypt. 107. Alexander I., King of Egypt.	140. Clock wheels invented by Ctesibius. 133. Equestrian order a distinct class. 130. Revival of learning in China.	Terence, <i>Comedies</i> ; <i>Andria</i> , <i>Phormio</i> , etc.  Aristarchus, greatest of Greek scholars.
The Romans govern all the countries around the Mediterranean. Corrupt rule of the Roman oligarchy is followed by civil wars, and establishment of the empire.	91. Social war in Italy. 88. War with Pontus. 82. Sulla defeats Marius, and is created perpetual dictator. Plunder of the temple of Delphi.  75. Bithynia a Roman province.  65. Syria becomes a Roman province. Cicero, Consul. 63. Catiline's conspiracy detected and suppressed by Cicero. 60. First triumvirate—Pompey, Crassus, and Cæsar.	91. Social war in Italy. 88. War with Pontus. 82. Sulla defeats Marius, and is created perpetual dictator. Plunder of the temple of Delphi.  75. Bithynia a Roman province.  65. Syria becomes a Roman province. Cicero, Consul. 63. Catiline's conspiracy detected and suppressed by Cicero. 60. First triumvirate—Pompey, Crassus, and Cæsar.	87. Alexandra, Queen of Jannæus, governs Judæa. Mithridates conquers Cappadocia. 80. Takes Bithynia.  66. Defeated by Pompey, Syria passes under Rome. 63. Judæa a Roman province.	87. Alexandra, Queen of Jannæus, governs Judæa. Mithridates conquers Cappadocia. 80. Takes Bithynia.  66. Defeated by Pompey, Syria passes under Rome. 63. Judæa a Roman province.	82. Revolt in Upper Egypt. Thebes destroyed. 81. Alexander II., King of Egypt.  65. Ptolemy Auletes, King.	98. Roman schools of oratory on Greek models instituted.  79. Posidonius calculates the height of the atmosphere. 74. The Romans possess gold mines in Asia Minor, Macedonia, Sardis, and Gadiz, and silver mines in Spain.	Libraries of Athens sent to Rome by Sulla.  Cæsar, <i>Juveniles</i> , <i>Comedies</i> .

## THE GREEK-ROMAN PERIOD—Continued

CHARACTERISTICS OF THE CENTURIES	THE ROMAN EMPIRE	EGYPT, CARTHAGE	ARTS, SCIENCES, ETC.	LITERATURE
<b>B. C. 100—1 A. D. Continued</b>	<p>55. Caesar passes the Rhine, defeats the Germans and Gauls, and invades Britain.</p> <p>53. Crassus defeated and killed in Parthia.</p> <p>51. Caesar completes conquest of Gaul, which becomes a Roman province.</p> <p>49. Civil war between Caesar and Pompey. Pompey defeated; Caesar, Dictator.</p> <p>48. Battle of Pharsalia—Pompey defeated by Caesar. Death of Pompey in Egypt.</p> <p>47. Caesar takes Alexandria, and conquers Egypt.</p> <p>44. Caesar assassinated in Roman Senate. Antony master of Rome.</p> <p>43. Second triumvirate—Octavius Caesar, Marc Antony, and Lepidus.</p> <p>42. Battle of Philippi; defeat and death of Brutus and Cassius.</p> <p>32-31. War between Antony and Octavius. By the battle of Actium (31), Octavius acquires the empire.</p> <p>30. Republic of Rome becomes a monarchy. Population of Rome 4,100,000 citizens.</p> <p>27. Titles of Augustus and Emperor conferred on Octavius for ten years.</p> <p>23. Agrippa subdues all Spain.</p> <p>21. Athens finally subjected to Rome.</p> <p>19. Death of Vergil.</p> <p>18. Parthians defeated.</p> <p>15. Cantabria, Austria, and other territory conquered by Drusus, is added to the empire.</p> <p>13. Augustus assumes the title of Pontifex Maximus.</p> <p>11. Germany subdued by Germanicus.</p> <p>10. Egyptian religion displaces national religion.</p> <p>5. Verrus appointed Governor of Syria, and Cyrenios Governor of Judea.</p> <p>4. Cymbeline, King of Britain.</p> <p>Advent of Christ, four years before the so-called Christian era.</p> <p>3. Death of Herod.</p> <p>2. Caesar confirms the will of Herod.</p>	<p>55. Auletes restored.</p> <p>46. The African war.</p> <p>45. Caesar rebuilds Carthage.</p> <p>43. Cleopatra poisons her brother, and rules alone.</p> <p>36. Cleopatra obtains from Antony a grant of Phenicia, Cyprus, and Cyprus.</p> <p>31. Defeat at Actium.</p> <p>30. Suicide of Antony and Cleopatra; Egypt passes to Rome.</p>	<p>62. Magnificent houses for Roman nobles erected. Also marble theater of Scaurus to hold 30,000 spectators.</p> <p>55. Iron chain cables used by the Venetians.</p> <p>50. A water mill erected on the Tiber at Rome.</p> <p>45. Caesar reforms the calendar by introducing the solar for the lunar year.</p> <p>30. Direct trade of Rome with India. Silk and linen factories in the empire.</p> <p>27. Treasures of Egyptian art brought to Rome. The Pantheon built.</p> <p>22. Pantomimic dances introduced on the Roman stage.</p> <p>19. Aqueducts constructed by Agrippa.</p> <p>12. Roman legions distributed over the provinces in fixed camps, which soon grew into cities—among them were Bona and Mayence.</p> <p>8. Calendar corrected by Augustus.</p>	<p>Cicero, <i>Orations, Essays, Letters</i>.</p> <p>Sallust, <i>Histories; Catiline's Conspiracy, War with Jugurtha, Memorials</i>.</p> <p>The Alexandria library burnt—400,000 volumes.</p> <p>Vergil, <i>Georgics, Aeneid</i>.</p> <p>Horace, <i>Odes, Letters</i>.</p> <p>Golden age of Roman literature begins.</p> <p>Livy, <i>History of Rome</i>.</p>

## PERIOD OF THE ROMAN EMPIRE, A. D. 1-476

CHARACTERISTICS OF THE CENTURIES	DEVELOPMENT OF CHRISTIANITY	THE ROMAN EMPIRE	ARTS, SCIENCES, ETC.	LITERATURE
<b>1—100 A. D.</b> Christianity founded amid persecutions.	<p>8. Jesus reasons with the doctors.</p> <p>25. Pontius Pilate, Governor of Judea.</p> <p>26. John the Baptist begins his ministry.</p> <p>27. Jesus baptized by John.</p> <p>29. Twelve Apostles sent abroad.</p> <p>30. Crucifixion of the Saviour, Friday, April 3, at 3 p. m.</p> <p>34. St. Paul converted to Christianity.</p> <p>40. Disciples first called Christians at Antioch.</p> <p>41. Herod's persecutions.</p> <p>50. Paul preaches at Athens.</p> <p>59. Paul appeals to Caesar.</p> <p>60. Paul imprisoned in Rome.</p>	<p>1. Caius Caesar makes peace with the Parthians. Tiberius returns to Rome.</p> <p>6. Varrus, overcame on the Weser, governs lower Germany like a Roman province.</p> <p>14. Augustus dies at Nola; is succeeded by Tiberius as Emperor.</p> <p>19. The Jews are banished from Rome.</p> <p>26. Thrace becomes a Roman province.</p> <p>30. Agrippina banished.</p> <p>37. Tiberius succeeded by Caligula, noted for his profligacy.</p> <p>48. Census of the city, 6,900,000.</p> <p>54. Nero, Emperor; a profligate and tyrant.</p> <p>61. Revolt of the Britons under Queen Boadicea.</p>	<p>9. Celsus advances the science of medicine.</p> <p>26. The Druids in Germany.</p> <p>50. Columella, born in Spain, writes on husbandry.</p>	<p>Ovid <i>Metamorphoses, Heroides</i>, etc.</p> <p>Appian of Alexandria writes on grammar.</p> <p>Plutarch <i>Lives, Morals, Table Talk</i>.</p>

## PERIOD OF THE ROMAN EMPIRE—Continued

CHARACTERISTICS OF THE CENTURIES	DEVELOPMENT OF CHRISTIANITY	THE ROMAN EMPIRE	ARTS, SCIENCES, ETC.	LITERATURE
<b>1-100 A. D.</b> <b>Continued</b>	64. First persecution of Christians by Nero. Paul visits Jerusalem. 66. Jews at war with Romans; Paul beheaded. 70. Destruction of Jerusalem, by Titus.	64. Nero sets fire to Rome; accuses Christians.  77. A great plague at Rome, 10,000 dying in one day. 79. Pompeii and Herculaneum destroyed by Vesuvius.  80. Agricola governs Britain, reduces Wales and enters Caledonia.  98. Trajan, Emperor; Roman empire at its greatest extent. 100. The Illyrs migrate westward.	64. Nero's golden palace built—of great extent.  78. The Capitol at Rome rebuilt. 80. Paintings executed for the baths of Titus; the group of the Laocoon. 98. The Ulpian library, Jurisprudence, Scurvius. Forum built. Pillar of Trajan, and Baths, bridge built over the Danube. 120. Great buildings of Palmyra. The Roman mooses. 132. Ptolemy, celebrated Egyptian astronomer and geographer. 180. Equestrian statue of Marcus Aurelius.	Epictetus <i>Discourses</i> , Tacitus <i>Germania</i> , <i>Annals</i> , etc.
<b>100-200 A. D.</b>  Zenith of the Roman empire. The good emperors. Persecutions of the Christians continued.	107. Third persecution by Trajan. 118. Fourth persecution by Adrian.    134. Heresy of Marcion. 150. Canon of Scriptures fixed about this time.	117. Hadrian, Emperor; makes a journey through the provinces; visits Britain, and builds there a wall from the Tyne to Solway Firth; builds a wall from the Rhine to the Danube.  138. Antoninus, Emperor; 145-163 defeats the Moors, Germans, and Parthians; stops the persecution of the Christians. 161. Marcus Aurelius, Emperor; 169, war with Marcomanni. 189. The Capitol at Rome destroyed by lightning. The Barabara defeat the Romans. 193. Septimius Severus, Emperor. A vigorous ruler. 194. Besieges Byzantium. 202. Persecutes the Christians; builds the wall of Severus in Britain. 211. Dies at York, in Britain. 213. Artaxerxes begins the new kingdom of Persia. 232. Persian war.	120. Great buildings of Palmyra. The Roman mooses. 132. Ptolemy, celebrated Egyptian astronomer and geographer. 180. Equestrian statue of Marcus Aurelius.	Quintilian <i>Rhetoric</i> and <i>Orator</i> . Galen, a celebrated physician and prolific writer. Kallias (In.) <i>Dramas</i> .
<b>200-300 A. D.</b>  Emperors chosen by the army. Frontier tribes troublesome. Persecutions continue.	202. Fifth persecution under Severus.    234. Sixth persecution under Maximian. 250. Seventh persecution of the Christians.   262. Paul, bishop of Samosata, denies the divinity of Jesus Christ.  272. Persecution of Christians under Aurelian.  282. The Jewish Talmud composed. Religious ceremonies multiplied. Pagan riots initiated by the Christians.	241. The Franks first mentioned in history. 251. Confederacy of the Franks established between the Rhine and Elbe. 256-60. Goths conduct expeditions into Asia Minor and Greece. 261. Sapor, the Persian, takes Antioch, Tarrus, and Ctesarea. 264. Alliance with Odenatus, King of Palmyra, who is succeeded by his wife Zenobia, who reigns with the titles of "Augusta" and "Queen of the East." 268. Claudius II. defeats an army of 320,000 Goths. 271. Aurelian, a great warrior, becomes Emperor; 271, defeats the Goths and Alemanni; 272, reduces Palmyra, and takes Queen Zenobia prisoner; 274, Franks, Spain, and Britain reduced to obedience; 275, Aurelian killed near Byzantium. 277. Probus, Emperor; 280, defeats the Persians. 284. Diocletian, Emperor.	215. Caracallagratia right of Roman citizenship to all the provinces. 225. Alexandrian School of Philosophy founded.	Tertullian <i>Apology</i> , <i>Praxis</i> . Chrysostom, <i>Homilies</i> , <i>Commentaries</i> , <i>Epistles</i> .
<b>300-400 A. D.</b>  Constantine moves the capital of the empire to Constantinople, and professes Christianity. Rise of Christian Monasticism. Great church disputes and growing corruptions. Increasing frontier troubles.	294. Mooks in Spain and Egypt. 303. Persecution under Diocletian. 304. Persecution of Christians stopped by Constantine. 325. Council of Nice.  337. Eleventh persecution.	291. The Franks master Batavia and Flanders. 296. Diocletian sends ambassadors to China.  304. Diocletian and Maximian resign the empire to Constantius and Galerius. 306. Constantine the Great, first Christian Emperor, defeats the Franks.  331. Constantine orders that all the heathen temples be destroyed. 337. Death of Constantine, and the accession of his three sons to the empire. 364. Death of Jovian, and the accession of Valentinian and Valens, under whom the empire is divided.	274. Rome surrounded with a wall.  284. Diocletian's Oriental form of government. Diocletian's Baths. 290. The Gregorian Code.	Origen, theologian.
		<b>WESTERN EMPIRE</b> 364. Valentinian, Emperor.	<b>EASTERN EMPIRE</b> 364. Valens, Emperor.	
	373. Bible translated into the Gothic language. Death of Athanasius.	368. The Saxons invade Britain, but are defeated by Theodosius. 373. Valentinian gains victory over the Germans; succeeds to the Eastern Empire on the death of Valens. 379. The Lombards first leave Scandinavia, and defeat the Vandals.	376. Hungary (ancient Pannonia) invaded by the Huns, from whom it is named. 379. Theodosius the Great becomes a zealous supporter of Christianity.	Gothic Bible of Ulfilas.
	379. Privileges of the Roman See much enlarged. 381. Second General Council of Constantinople. 384. Symmachus pleads in the Roman Senate for Paganism against St. Ambrose.	388. Theodosius defeats Maximus, Tyrant of the Western empire.		Latin Bible of Jerome.

## THE GREEK-ROMAN PERIOD—Continued

CHARACTERISTICS OF THE CENTURIES	DEVELOPMENT OF CHRISTIANITY	WESTERN EMPIRE	EASTERN EMPIRE	ARTS, SCIENCES, ETC.	LITERATURE
<b>400—500 A. D.</b> Continued	392. St. Chrysostom, Patriarch of Constantinople.  416. The Pelagian heresy condemned.  431. Third General Council at Ephesus. 432. St. Patrick preaches the gospel in Ireland. 435. Nestorianism prevails in the East.  443. The Manichean books burned in Rome. 447. Eutyches asserts the existence of only one nature in Jesus Christ. 451. Fourth General Council at Chalcedon.  465-476. Oligarchy of the bishops of Rome, Constantinople, Alexandria, Antioch, and Jerusalem. The church now begins to assume a political aspect.	392. Theodosius becomes sole Emperor of the East and West. Complete downfall of Paganism. 394. Final division of empire between the sons of Theodosius. 401. Europe overrun by the Visigoths. 406. Vandals allowed to settle in Spain and Gaul. 410. The Goths under Alaric sack and burn Rome. 412. Rise of the Vandal power in Spain. 413. Burgundian kingdom begun in Alsace.  420. The Franks form a kingdom, under Pharamond, on the lower Rhine. 424. Valentinian III., Emperor.  426. Britain evacuated by the Romans. 428. Romans defeated by the Franks and Goths. Franks, under Clovis, extend their conquests. 433. Attila forms an immense empire from China to the Atlantic. 439. The Vandals, under Genseric, form Kingdom of Africa, take Carthage and plunder Italy. 441. Roman territories invaded by the Huns, Persians, and Saxons. 445. Famous embassy from Britain's pleading aid against the Picts. 448. Mercurius I., first King of the Norwegians. 451. Arrival of Saxons in Britain under Hengist and Horsa. 452. City of Venice founded. 458. Franks, under Childeric I., conquer as far as the Loire and take Paris. 468. The Visigoths under Euric establish their kingdom in Spain.  476. Odoacer, King of the Heruli, takes Rome, and the Western empire ends 1228 years after the founding of the city. Commencement of the Kingdom of Italy under Odoacer.	408. Theodosius II., a child, Emperor.  414. Regency of the emperor's sister, Pulcheria. 420. Persian war.  431. Armenia divided by the Persians and Romans. 432. A great part of Constantinople destroyed by fire. 437. Pannonia, Dalmatia, and Noricum gained from the Western empire.  450. Marcian, Emperor, refuses to pay tribute to the Huns. 457. War with the Goths. 461. Peace with the Goths. 474. Zeno, Emperor; a turbulent reign marked by debauchery and conspiracies. 475. Theodoric becomes chief of the Ostrogoths and invades the empire.	392. Impulse given to the development of mathematics at Alexandria.  425. Theodosius establishes public schools and attempts the restoration of learning.  435. Theodosian Code published.  468. The principle of law established that the accused shall be tried by his peers, or equals. 476. Odoacer's sack of Rome changed the course of events in Europe. The form of the old Roman government remained, but Italy, ravaged by a succession of wars, plagues, famines, and every form of public tyranny, was almost a desert.	Epic of Musaeus, <i>Hero and Leander</i> .

## FROM THE FALL OF ROME TO THE AGE OF MOHAMMED, A. D. 476-622

CHARACTERISTICS OF THE CENTURIES	THE EASTERN EMPIRE	GREAT BRITAIN AND IRELAND	ITALY AND THE CHURCH	FRANCE	ARTS, SCIENCES, ETC.	LITERATURE
<b>400—500 A. D.</b> Continued	490. An earthquake destroys greater part of Constantinople.  491. The Greco and Blue factions.	467. The Saxons defeated by Prince Arthur. 490. Sueton becomes a kingdom.	484. Christians persecuted by the Vandals.  483. Italy conquered by Theodoric. Odoacer put to death. 494. The Roman Pontiff asserts his supremacy. 496. Christianity introduced into France.	481. Clovis I., founder of the French monarchy. 485. Battle of Soissons gained by Clovis.  491. Clovis subdues Thuringia.	486. Rise of the feudal system in France under Clovis.  493. Theodoric introduces Greek architecture into Italy.	Boethius' <i>Consolation of Philosophy</i> .
<b>500—600 A. D.</b> Great disorders in the West. Beginnings of Feudalism; power of the clergy increases. In the East, the great reign of Justinian.	502. Invasions by the Persians. 511. Great insurrection in Constantinople.			510. Clovis makes Paris his capital.	511. The Salic law in France.	

## FROM THE FALL OF ROME TO THE AGE OF MOHAMMED, A. D. 476-622—Continued

CHARACTERISTICS OF THE CENTURIES	THE EASTERN EMPIRE	GREAT BRITAIN AND IRELAND	ITALY AND THE CHURCH	FRANCE	ARTS, SCIENCE, ETC.	LITERATURE
<b>500-600 A. D. Continued</b>	514. Constantinople besieged by Vitalianus, whose fleet is consumed by the burning glass of Proclus.				514. Use of the burning glass in warfare.	
	516. Justinian I. begins a brilliant reign over the Eastern or Byzantine empire.	519. Prince Arthur defeated by Cadric, who begins the third Saxon Kingdom of Wessex.			516. The Christian era proposed and introduced by Dionysius, a monk.	
	527. Celebrated Justinian code of laws.					
	529. Belisarius, the famous general, defeats the Persians.	530. Kingdom of Essex.	529. Order of the Benedictine Monks instituted at Monte Cassino, near Naples.	532. Burgundy conquered by Childebert.	529. The schools of Athens suppressed.	Writings of Gregory the Great.
	534. Defeats the Vandals in Africa.		537. Italy conquered by Belisarius, for Justinian.	536. Ostrogoths surrender their possessions in Gaul to the French king.		
	535. Subduces Italy.		539. War, famine, and pestilence. Milan ravaged by the Goths.			
	536. Takes Naples.	542. Prince Arthur murdered in Cornwall.				
	537. Takes Rome.					
	540. North Africa, Corsica, and Sardinia annexed to the Eastern empire.					
	548. The Turkish monarchy founded in Asia.					
	554. Italy governed by Greek emperors.			557. Church of St. Germain des Pres built at Paris.	551. Manufacture of silk introduced from China into Europe by monks.	
<b>600-700 A. D.</b>	558. A plague extends over Europe and Asia and lasts about 50 years.	559. Saxon heptarchy begins.		558. Clotaire I., King.		559. The Saxon laws promulgated. The king's authority limited by the Wittenagemot. Three orders: the noble, the free, and the servile.
	569. The Turks first mentioned in history. They send an embassy to Justin II., and form an alliance.	575. East Angles formed into a kingdom, whence the origin of the name England.	568. Italy conquered by the Lombards.		568. The feudal system established in Italy by the Lombards. Written laws compiled by the Visigoths in Spain. The aristocracy acquires great power in France. Rises and superstitions increase all over Europe.	569. The king's authority limited by the Wittenagemot. Three orders: the noble, the free, and the servile.
	600. Eastern empire spread over Hungary, Poland, and Prussia, under Tiberius II.		576. First monastery built in Bavaria.			
	602. Invasion of the Persians.		598. St. Augustine, first archbishop of Canterbury, introduces Christianity into Britain.			
	610. Heraclius takes Constantinople, kills Phocas, the emperor, and makes himself king.	604. St. Paul's church founded by Ethelbert of Kent.				
	612. Mohammed publishes the Koran. Syria ravaged by the Arabs.	607. Supremacy of the pope acknowledged.	607. The Pantheon of Rome dedicated to Christianity.			
	614. Jerusalem taken by the Persians.					
		617. St. Peter's (now Westminster Abbey) founded by Robert, King of Kent.				

Rise and wonderful spread of Mohammedanism from Arabia to Siude on the east, and Carthage on the west. Christianizing of Germany.

## THE AGE OF MOHAMMED TO THE TREATY OF VERDUN, A. D. 622-843

CHARACTERISTICS OF THE CENTURIES	THE EASTERN EMPIRE	GREAT BRITAIN AND IRELAND	ITALY AND THE CHURCH	FRANCE	ARTS, SCIENCE, ETC.	LITERATURE
<b>600-700 A. D. Continued</b>	622. The Begins, or Mohammed's flight from Mecca to Medina.					
	632. Death of Mohammed.					
	633. Omar, Caliph, takes Jerusalem, which is held by the Saracens 463 years.	633. Bretwald V. embraces Christianity.	625-640. Churches of Jerusalem, Antioch and Alexandria lost to the Christian world by the sweep of Mohammedanism.	628. Dagobert I. builds the Church of St. Denis, the seat of the French kings.	632. Islamism and the power of the caliphs established in the East. In the caliphs were united the highest spiritual and regal authority.	The Koran.
	673. Siege of Constantinople by the Saracens, whose fleet is destroyed by the Greek fire of Callinicus.			638. Kingdom divided by Clovis II. and Sigebert, the latter King of Austrasia.	674. Stone buildings and glass come into use in England. The Anglo-Saxons advance in civilization and power by the introduction of Christianity.	Cædmon's Paraphrase of Scripture.
	680. Kingdom of Bulgaria founded.					
		690. The name England first used.	680. The Sixth General Council called at Constantinople.	690. Pepin d'Héristal, King.		

## THE AGE OF MOHAMMED TO THE TREATY OF VERDUN—Continued

CHARACTERISTICS OF THE CENTURIES	THE EASTERN EMPIRE	GREAT BRITAIN AND IRELAND	ITALY AND THE CHURCH	FRANCE	ARTS, SCIENCES, ETC.	LITERATURE
<b>700-800 A. D.</b>  Christianizing of Germany continues. Hostile caliphates of Bagdad and Cordova. Mohammedan advance in the West checked by Charlemagne, who nominally restores the Western Roman empire. Norms ravages begin.	698. Carthage destroyed by the Saracens, and the north coast of Africa subdued. 709. All Africa subdued by the Saracens. 716. Leo III., Emperor. The Saracens invest Constantinople, by land and sea. City saved by Greek fire. 746. Saracens defeated by Constantine V. 762. Caliph Almansor builds Bagdad and makes it his capital. 766. Asia Minor ravaged by the Turks. 783. Empire invaded by Haroun-al-Raschid, caliph of Bagdad.  <b>800-900 A. D.</b>  Norms ravages continue. Private wars. Charlemagne's empire falls to pieces.  803. The Saracens ravage Asia Minor.  823. Constantinople besieged by the Saracens. The Bulgarians raise the siege. 829. Theophilus, Emperor.  838. Ethelwulf, King. Kenneth, King of the Scots, defeated and extirpates the Picts, and becomes sole monarch of Scotland.	700. Anglo-Saxon octarchy. 705. Alfred the Wise in Northumbria.  727. Ina, King of Wessex, begins collection of Peter's pence to support a college at Rome. 735. Death of the Venerable Bede.  787. First recorded invasion of the Danes, the sea kings and vikings.  813. Egbert, King of Wessex, defeats the Britons.  827. The seven kingdoms of heptarchy united by Egbert under the name of England, or the land of the Angles. Invasion of the Danes. 838. Ethelwulf, King. Kenneth, King of the Scots, defeated and extirpates the Picts, and becomes sole monarch of Scotland.	698. Picts adopt Christianity. 704. The first province given to the pope, John VI.  726. The Emperor Leo forbids image worship.  752. The pope deposes Childeric, King of France, by a papal decree. 755. Beginning of the pope's temporal power.  787. Seventh General Council of Nice.  800. The pope separates from the Eastern empire and becomes supreme bishop of the Western. Charlemagne reforms the church. Many bishoprics founded.  817. College of Cardinals founded.  824. Christianity carried to Denmark and Sweden.	700. Aquitaine, Burgundy, and Provence become separate dukedoms. 714. Charles Martel, duke of Austrasia. 725. Charles Martel subdues Bavaria. 732. Defeats the Saracens at Tours.  752. End of Merovingian line of French kings. Pepin the Short, first of the Carolingian line. 764. Extirpates the Huns.  791-6. Establishes the marriage of the nobles.  800. Charlemagne founds the new Western empire and is crowned at Rome king of Italy, Germany and France. 802. Receives an embassy from Haroun-al-Raschid. 806. Charlemagne divides the empire among his sons, only one of whom survived him—Louis I. 817. Louis I. divides the empire.  841. Another division of the empire. Charles I., King of France; Louis I., King of Germany; Lothaire, King of Italy.	698. Christianity greatly extended among the German nations in the north of Europe, but almost exterminated in Africa by the progress of Mohammedanism. 716. The art of making paper introduced by the Arabs.  740. Saracens encourage learning. Ignorance, profligacy, and misery characterized the age preceding Charlemagne.  785. Golden period of learning in Arabia under the Caliph Haroun-al-Raschid. 788. Pleadings to courts of justice first practiced. 793. Foundation of schools in monasteries and cathedrals by Charlemagne.  800. Agriculture and horticulture encouraged by Charlemagne; in Spain flourish in both under the caliph.  802. Arabian horses introduced into Spain.  813. Transient revival of learning under Charlemagne. The reign of Caliph Memun the golden epoch of Arabian literature.  828. St. Mark's church at Venice built.  840. Feudal system in its power.	Golden age of Saracen literature begins.  <i>Romance of Amour.</i>  Alcuin's letters and biographies.  Beginning of the Icelandic sagas.  Arabic histories of Mecca and Medina.

## FROM THE TREATY OF VERDUN TO THE DARK AGES, 843-936 A. D.

CHARACTERISTICS OF THE CENTURIES	EASTERN EMPIRE	THE BRITISH ISLES	ITALY AND THE CHURCH	FRANCE AND GERMANY	SPAIN, RUSSIA AND NEARBY COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
<b>800-900 A. D. Continued</b>	844. Decline of the caliphate begins. Frequent wars between the Greeks and the Saracens.	849. Alfred the Great born.	844. Ignatius, patriarch of Constantinople. Persecution of the Christians to Spain. 846. The Saracens destroy the Venetian fleet and besiege Rome.	841. Louis I., King of Germany. 843. Treaty of Verdun. Charles I. (the Bald), King of France.	843. Ramiro I. elected king of Oviedo.  846. The Saracens destroy the Venetian fleet and besiege Rome.	841. Hereditary nobility and the clergy dominant to matters of state.  850. Roman and common law introduced.	Ortvid's Gospel Book.





## PERIOD OF THE DARK

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	EASTERN EMPIRE	THE BRITISH ISLES	FRANCE
<b>1000—1100 A. D. Continued</b>	<p>1048. Leo IX. the first Pope to keep an army.</p> <p>1054. Excommunication of the Patriarch of Constantinople and the Greeks.</p> <p>1059. Quarrel between the popes and the German emperors.</p> <p>1066. Pope Alexander II. deposes Harold, and gives England to William the Conqueror. The papacy at the height of its power.</p> <p>1070. Lanfranc, Archbishop of Canterbury.</p> <p>1073. Quarrel of Pope Gregory VII. (Hildebrand) with the Emperor Henry IV.</p> <p>1075. The Pope sends legates to the various courts of Europe.</p> <p>1076. Submission of Henry IV. to the Pope.</p> <p>1084. Triumph of Henry IV. over Gregory. The order of the Carthusians instituted by Bruno.</p> <p>1095. Peter the Hermit preaches against the Turks.</p>	<p>1042. First invasion of the Seljuk Turks.</p> <p>1043. The Russians invade Thrace with 100,000 men and are repulsed by the Greeks.</p> <p>1054. Theodora, last of the Macedonian dynasty.</p> <p>1067. Emperor Romanus III. defeated and taken prisoner by the Turks.</p> <p>1074. Syria and Palestine subdued by Melik Shah.</p> <p>1081. Alexius I. (Comnenus), Emperor. Robert Guiscard invades the empire and defeats Alexius.</p>	<p>1042. The Saxon line restored under Edward the Confessor.</p> <p>1051. William, Duke of Normandy, visits England.</p> <p>1066. Harold II. King, killed at the battle of Hastings. William the Conqueror, King. End of the Anglo-Saxon line.</p> <p>1070. Feudal system introduced.</p> <p>1076. Rebellion in Normandy.</p> <p>1087. William invades France and is killed at Nantes.</p> <p>1093. Malcolm III., of Scotland, invades England, and is slain near Alnwick castle.</p>	<p>1046. Dispute between William the Conqueror and William of Arques for the dukedom of Normandy.</p> <p>1066. William, Duke of Normandy, claims the crown of England and wars on Harold to obtain it.</p> <p>1070. Rise of the troubadours in Provence.</p> <p>1079. Birth of Abelard.</p> <p>1087. War with England. Robert, Duke of Normandy, opposes William Rufus.</p>

## PERIOD OF THE CRUSADES.

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	EASTERN EMPIRE	THE BRITISH ISLES	FRANCE
<b>1100—1200 A. D.</b>	<p>Quarrels between popes and emperors continue; zenith of papal power; Frederick Barbarossa. Criticism revived.</p> <p>Private wars lessen; advance in power of kings and of towns at expense of the feudal baronage.</p> <p>The Crusades.</p> <p>Improved judicial arrangements in England.</p>	<p>1099. Invasion by the Crusaders.</p> <p>1104. Battle of Acre.</p> <p>1109. Tripolis taken by Crusaders.</p> <p>1118. John I. reforms the manners of his people. Tyrants taken by Crusaders.</p> <p>1143. Manuel Comnenus, Emperor.</p> <p>1155. Manuel forms the design of conquering Italy and the West but fails.</p>	<p>1100. Henry I., King of England, unites the Normans and Saxons.</p> <p>1107. Henry quarrels with Anselm.</p> <p>1134. David I. promotes civilization in Scotland.</p> <p>1154. Henry II., King of England.</p> <p>1155-1164. Ascendancy of Thomas à Becket, Archbishop of Canterbury.</p> <p>1172. Henry conquers Ireland.</p>	<p>1096. Many French nobles take part in the First Crusade.</p> <p>1108. Abbe Suger, minister to Louis VII. of France.</p> <p>1120. Rivalry between England and France begins.</p> <p>1147. Louis VII. joins the Second Crusade.</p> <p>1159. War with the English.</p> <p>1170. Rise of the Waldenses.</p>

## AGES, 936-1096—Continued

GERMANY	SPAIN	RUSSIA	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
1030. Henry III. defeats the Bohemians and Hungarians.	1035. Ramiro I., King of Aragon.	1036. Russia reunited by Jaroslav.			
1053. Henry causes his son, Henry, to be proclaimed King of the Romans. This title was applied for several centuries to the emperor's eldest son.	1055. Alfonso, King of Castile and Leon.	1054. Russia divided a second time. Civil wars and great distress.	1055. The Turks reduce Bagdad and overturn the empire of the caliphs. 1059. Ingo I., first Christian King of Sweden. 1060. Robert Guiscard, Duke of Apulia. 1065. Jerusalem taken by the Saracens. 1067. Polish conquests in Russia. 1068. Olaf III., King of Norway. 1070. Bergen, Norway, built.	1055. First age of scholastic philosophy. 1062. Surnames first used among the English nobility. 1066. Shoeing horses introduced into England.	Runic inscriptions.
1072. Henry IV. summoned before the Pope for selling the investiture of bishops; treats the mandate with contempt.	1068. Flight of Alfonso to Toledo.				
1073. Summoned again.				1073. Bookellers first heard of.	
1076. Henry sends an ambassador to depose the Pope, and is excommunicated. Undergoes penance and submission.	1076. Time of the Cid.				
1080. Henry degrades the Pope and triumphs.	1085. Toledo taken from the Moors by the Cid. 1086. Battle of Zalaca.		1084. Bohemia made a kingdom by Henry IV. of Germany. 1090. Sicily taken from the Saracens by Roger the Norman.	1084. Rigid police system established in England. 1090. Fortresses at Newcastle and Carlisle built.	<i>Song of Roland.</i>
1093. The Popes continue their struggle against the empire.	1094. Pedro I., King of Navarre and Aragon.				

## A. D. 1096-1273

GERMANY	SPAIN	RUSSIA	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
	1104. Alfonso I., King of Navarre and Aragon.		1105. War between Norway and the Wends.		William of Poitou, first troubadour of note.
1109. Henry V. enters Italy, takes the Pope prisoner, and compels him to crown him.					
1114. Henry V. marries Matilda, of England.	1118. Alfonso captures Saragosa.		1119. War between Pisa and Genoa.	1118. Knights Templar instituted.	Scholastic philosophy reaches a high point under Abelard. Aristotle's logic comes into repute.
1125. Lothaire II. opposed by Frederick, and Conrad, Duke of Suabia.	1139. Portugal becomes a kingdom under Henry of Beascon.	1128. Riga on the Baltic founded.		1140. Gratian collects the canon law.	<i>Nibelungenlied.</i>
1141. Disensions of the Guelphs and Ghibellines.		1147. Moscow founded.	1150. Eric X., King of Sweden.	1150. Magnetic needle known in Italy.	
1152. Frederick I., Emperor of Germany and Italy.	1157. Castile and Leon divided.		1158. Venice a great maritime power.	1158. Bank of Venice established. Colleges of theology, philosophy, and law at Paris.	
1158. The Emperor Frederick receives the title of King of Bohemia.			1167. League of the Italian cities.	1168. Colleges of law, philosophy, and theology at Paris.	
1167. Rome taken by Frederick.			1171. Saladin, Sultan of Egypt, extends his dominions. Conquers Syria, Assyria and Arabia.		

## PERIOD OF THE

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	EASTERN EMPIRE	THE BRITISH ISLES	FRANCE
<b>1200—1300 A. D.</b> Rise of Universities, and of Mendicant Friars. Quarrels between popes and emperors still continue; Frederick II. of Germany. Last Crusades. English liberties recognized by the crown. Hanse League established. Great conquests of Tartars in Asia; they overrun Russia and establish a dynasty at Moscow.	1190. Third Crusade. 1198. Power of the Pope supreme over temporal matters. 1202. The Fourth Crusade. Constantinople taken. 1215. Fourth Lateran Council against the Albigenses. 1217. Fifth Crusade. 1243. Struggle of Pope Innocent IV. with the Emperor Frederick. 1268. Domination of Italy passes to the Pope.	1100. Iconium taken by Frederick Barbarossa but afterward restored. 1204. The Crusaders plunder Constantinople. 1260. Emperor Michael Palaeologus recovers Constantinople. 1268. The Mongols invade Asia Minor and take Antioch.	1189. Richard I. engages in the Third Crusade. 1193. John attempts to seize the crown in the absence of Richard. 1200. John, King of England. 1215. Magna Charta signed at Runnymede. 1216. Henry III., King. 1246. Henry marries Eleanor of Provence. 1258. Famous parliament at Oxford. 1265. First regular parliament. Civil war.	1183. The peace of Constance reestablishes the independence of the Italian republics. 1190. Philip Augustus one of the leaders of the Third Crusade. 1204. Normandy reunited to France. 1223. Louis VIII. conducts crusades against the Albigenses. 1226. Louis IX., King. 1248. Louis IX. leads the Seventh Crusade. 1267. Burgundy falls to the crown. 1270. Louis IX. sets out on the last Crusade.

## PERIOD OF THE RENAISSANCE,

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	EASTERN EMPIRE	THE BRITISH ISLES	FRANCE
<b>1300—1400 A. D.</b> Growth of cities and trade—especially in Italy, where also literature and art, inspired by Dante and Giotto, make progress. Popes at Avignon; papacy now terribly corrupt. Era of Wyclif; his teaching spreads in Bohemia. Invention of gunpowder; Mariner's compass comes into use in the West.	1274. Fourteenth General Council at Lyons. 1296. Struggle of the church with France. 1303. Papal power declines. 1309. Seat of the popes transferred to Avignon. 1311. General Council at Vienna. 1339. Struggle in Rome between the Colonna and the Ursini. 1347. Democracy in Rome under Rienzi, last of the Tribunes.	1281. Othman establishes an independent rule in the north of Asia Minor. 1299. Othman invades Nicomedia, and establishes the Ottoman empire. 1303. Genoese control trade of Black Sea. 1320. Civil war in the eastern empire between the emperor and his son. 1326. Orkhan, Sultan of the Turks, makes Prusa his capital. 1339. Struggle in Rome between the Colonna and the Ursini.	1276. War between England and Wales. 1283. England and Wales united. Robert Bruce and John Balliol contend for the crown of Scotland. 1296. Scotland submits to England. 1297. Scotland rebels. War between England and Scotland follows. 1300. Silverplate used in England. 1306. Robert Bruce proclaimed King of Scotland. War with England continued. 1327. Peace. Independence of Scotland. 1333. Struggle for the French crown begins; lasts 120 years. 1346. Battle of Cressy.	1276. France at war with Castile. 1297. Invasion of Flanders. 1302. First convocation of the states-general in France. 1304. War with Flanders. 1316. Philip V. succeeds by virtue of the Salic law, now first established. 1332. Revolt of the Flemings. 1338. War with England. 1348. Normandy overrun by Edward of England.

## CRUSADES—Continued

GERMANY	SPAIN	RUSSIA	LESSER COUNTRIES	ARTS, SCIENCE, ETC.	LITERATURE
1163. Italy independent by treaty of Constance.					
1190. Henry VI, Emperor and King of Italy.	1188. Alphonso IX., King of Leon.	1186. Invasion of Huns and Poles into Russia.	1186. Saladin directs all his efforts against the Crusaders.	1190. The Jews become the principal bankers of the world.	<i>Arabian Nights</i> . <i>Prose Bidd.</i>
	1212. The Christians gain the Battle of Navas de Tolosa.	1213. Jürje II.	1193. Battle of Ascalon. Saladin defeated. Death of Saladin.	1200. University of Bologna has 10,000 students.	Period of the troubadours in France; the minstrels in England; minnesingers in Germany. <i>Poem of The Cid</i> .
1212. Frederick II., Emperor.	1217. Ferdinand, King of Castile.		1216. Tartary overrun by Genghis Khan.	1222. University of Padua founded.	
		1224. Mongolian invasion known as the "Golden Horde."	1222. Hungarian liberty assured by Charter of Andrew II.		
1243. The Hanseatic League.	1230. Castile and Leon united by Ferdinand III., who takes large territory from the Moors.	1236. Second Mongolian invasion. Moscow burned.	1236. Mongolian invasion of Europe under Batu Khan.		Sadi, the Persian poet.
1250. Conrad IV., Emperor.	1233. The Alhambra founded.	1238. Russian independence overthrown by the Tartars. Khan of Kiptchak, Grand Duke.		1247. First war fleet in Spain.	Roger Bacon writes on natural sciences.
	1266. Henry of Castile a Roman senator.		1259. Kubla Khan builds Pekin and makes it his capital.	1261. Parliament in England.	

## —A. D. 1273-1492

GERMANY	SPAIN	RUSSIA	LESSER COUNTRIES	ARTS, SCIENCE, ETC.	LITERATURE
1273. Rudolf, Emperor, founds House of Hapsburg.	1274. Crown of Navarre passes to France.			1273. First patent of nobility granted in France.	Literature and science flourish in Spain under Alphonso the Learned.
	1291. James II., King of Aragon.	1290. Khan of Kiptchak wields strong rule in Russia.	1290. Wenceslas, King of Bohemia, takes Craoow.	1285. Institution of the three great courts of law in England. Cimabue, the first of modern painters at Florence.	Master Eckart, mystic.
1296. Adolphus, Emperor, deposed, and Albert I. enthroned.	1300. Disensions in the Moorish state.	1300. Moscow made the capital.	1299. Foundation of the Ottoman Empire.	1300. Rapid advances in civilization—revival of ancient learning—improvements in the arts and sciences—and general expansion of liberty.	<i>Romance of the Rose</i> .
1304. Rise of the Swiss towns.				1302. Marinus compass invented at Naples.	
1306. Rudolf of Austria, Emperor.				1303. University Avignon.	
1308. Henry of Luxemburg, Emperor. General insurrection in Switzerland.				1304. University Orleans.	
1314. Louis of Bavaria and Frederick of Austria contend for the crown.	1312. Alphonso XI., King of Castile and Leon.		1307. Swiss Republic founded.	1307. University Perugia.	Teulor's <i>Sermone</i> .
		1318. Finland invaded by Russians.		1308. University Coimbra.	
1322. Frederick of Austria defeated.			1319. The Oligarchy of Venice established.	1311. Governmental reforms started from Edward II. in England.	
	1327. Arrival of 200,000 Moors to assist Granada.		1326. Tamerlane born at Keek, Tartary.	1326. Clocks constructed on mathematical principles.	
	1340. Moors defeated at Tarifa.			1340. Gunpowder used at battle of Crécy.	Wyclif's <i>Translation of the Bible</i> .
			1353. Establishment of the Ottomans in Europe.	1347. Manufacture and commerce improve in England.	

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	EASTERN EMPIRE	THE BRITISH ISLES	PERIOD OF
<b>1400—1500 A. D.</b> Failure of the Council of Constance to reform the Church. Turks take Constantinople. Revival of learning and advance of art in the west—especially in Italy. Consolidation of France and Spain. End of Tartar rule in Russia. Invention of printing. Gunpowder begins to be of great importance. Formation of modern "middle classes." Maritime discoveries: The cape route to India; The "New World." End of the Middle Ages.	1354. Riens killed: papal dominion restored.  1378. Schism of the west; Pope Urban VI. acknowledged in England; Clement VII. in France, Spain and Scotland.  1409. The Council of Pisa.  1414. Council of Constance.  1416. Huss and Jerome burned for heresy.  1429. Schism of the west ended.  1448. Concordat of Aschaffenburg, by which the liberties of the German church are compromised.  1454. Struggle between Cosmo de' Medici and the aristocracy. 1456. The French rule in Genoa.  1463. War of Venice with the Turks.  1469. Lorenzo de' Medici succeeds Piero at Florence. 1471. Increase of the power of the Medici. Rise of learning. Sixtus IV., Pope.	1355. John Palaeologus, emperor.  1373. Treaty with Murad, the Ottoman emperor.  1389. Bajazet, Sultan of the Turks.  1402. Bajazet defeated and made prisoner by Tamerlane, at the battle of Angora. 1403. Solymen I., Sultan of the Turks.  1426. Emperor John VII. visits Italy to obtain help against the Turks.  1444. Vladislas, King of Poland, defeated and killed by the Turks.  1448. Constantine XII., last of the Greek emperors. 1453. Siege and capture of Constantinople by the Turks, ending the Eastern Empire. OTTOMAN EMPIRE 1458. Greece subjected to the Turks.  1464. War with Hungary.  1480. Otranto taken. 1481. Bajazet II., Sultan.	1356. Edward, the Black Prince, wins the battle of Poitiers.  1376. Death of the Black Prince.  1384. The Scots, assisted by France, invade England.  1399. Henry IV., King. House of Lancaster begins.  1405. James I., King of Scotland.  1414. Henry V. claims the French crown. 1415. Gains the battle of Agincourt.  1422. Death of Henry V. Ascension of Henry VI. War with France.  1444. Truce with France. Marriage of Henry to Margaret of Anjou.  1450. Insurrection of Jack Cade. Wars of the Roses. Richard, Duke of York, claims the throne.  1455. Wars of the Roses begin.  1460. James III., King of Scotland. 1461. Edward IV., King. House of York.  (Warwick) 1470. Henry VI. restored by Warwick. 1471. Return of Edward IV. Deaths of Warwick and Henry VI.  1475. Edward IV. invades France.  1480. War between England and Scotland.	1356. King John defeated and taken prisoner at Poitiers. Charles the Dauphin, Regent.  1380. Charles VI., King. Defeat of the Flemings at Roosbecq.  1386. Fruitless attempt to invade England.  1410. Civil war between Orleans and Burgundy.  1415. Defeat by the English at Agincourt.  1422. Henry VI. proclaimed at Paris King of France and England. 1427. Orleans besieged by the English. 1429. Saved by Joan of Arc. Charles VII. crowned at Rheims. 1431. Joan of Arc burned.  1453. End of the French and English wars.  1461. Louis XI., King.  1475. War between France and Burgundy. 1477. Artois and Burgundy united to France.  1491. Bretagne united to the crown.

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	GREAT BRITAIN	GERMANY	SPAIN AND PORTUGAL	FRANCE
<b>1500—1600 A. D.</b>	1492. Alexander VI., Pope.  1500. Partition of Naples between France and Spain.	1492. Henry VII. invades France.	1493. Maximilian I., Emperor.	1492. Conquest of Granada. Discovery of America by Columbus. 1498. Vasco da Gama reaches India via Cape of Good Hope.	1499. Conquest of Milan.

## RENAISSANCE—Continued

GERMANY	SPAIN	RUSSIA	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
1355. Promulgation of the Golden Bull.			1359. Hungarian conquests on the Danube.		Froissart's <i>Chronicles</i> .
1378. Wenceslas (King of Bohemia), Emperor.		1380. Tartar war. Dimitri Ivanovich checks them at the Don. 1382. Moscow burned.	1385. War between Austria and Switzerland.	1386. Jan Van Eyck invented oil painting.	
1394. The Emperor imprisoned at Prague.		1395. Tamerlane invades Russia. Russia under the Mongol Tartars until 1402.	1399. Invasion of India by Tamerlane.		
1401. Robert, Count of Palatine, Emperor.					
1411. Sigismund (King of Hungary), Emperor.	1407. John II., King of Castile.			1409. University of Leipzig founded.	Villena's <i>Labors of Hercules</i> .
	1416. Alphonso V., King of Aragon and Sicily.		1410. The Hussite war in Bohemia.	1425. Arts promoted in Italy.	
	1430. War between Castile and Granada.		1437-1438. Rise of Portugal.	1434. Invention of printing at Mayceen.	
1435. House of Austria established. Albert II. (King of Bohemia and Hungary), Emperor.		1441. Kiptchak Mongols divide Russia.		1447. Library of the Vatican founded.	Malory's <i>Morte d'Arthur</i>
1446. War with Hungary.			1450. Kingdom of Delhi enlarged.	1450. Flourishing period of trade in western Europe, particularly in Flanders, New Netherlands, Belgium, and a portion of France.	
1453. Austria made an hereditary duchy by emperor Frederick III.	1452. Civil war in Navarre, in which Castile and Aragon join.		1453. Poland's independence confirmed by diet of Piotrkow.		
	1454. Henry IV. of Castile, King of Spain.		1454. Poland at war with the Teutonic order.	1460. Wood engraving invented.	
1462. The Emperor besieged in court at Vienna.		1462. Ivan the Great takes the title of Czar.	1466. Prussia a fief of Poland.	1464. Post-offices in France and England.	
1469. Invasion of the Turks.	1469. Marriage of Ferdinand of Aragon with Isabella of Castile.		1468. Unun Hassan, master of Persia.	1470. Bernhard invents the pedal to the organ.	
		1472. Ivan marries Sophia, niece of the Greek emperor.	1470. Sten Sture, Regent of Sweden.	1473. Printed musical notes. Large library founded at Offen.	
1477. Marriage of Maximilian and Maria of Burgundy.	1479. Union of Castile and Aragon.	1479. Great invasion of the Tartars. 1481. Power of the Tartars annihilated.	1481. John, King of Denmark, partially acknowledged in Sweden. 1485. Matthias of Hungary takes Vienna.	1477. Watches made at Nuremberg.	Machiavelli's <i>Prince</i> .

## RELIGIOUS WARS, A. D. 1492-1648

RUSSIA	SCANDINAVIA	OTTOMAN EMPIRE	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
		1493. War with Egypt, Hungary and Venice.	1492. America discovered by Columbus.	1493. Printing press at Copenhagen. Era of discovery in the New World begins.	More's <i>Utopia</i> . Luther's <i>Bible</i> .
			1499. Voyage of Amerigo Vespucci.		
			1502. Sull sole Sovereign of Persia.	1502. St. Peter's and other great churches built.	

## PERIOD OF THE REFORMATION

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	GREAT BRITAIN	GERMANY	SPAIN AND PORTUGAL	FRANCE
<b>1500-1600 A. D.</b> The Reformation. Immense development of new life in Europe. Power of Spain, and her conquests in America. The monarchy strong in England.	1503. Naples annexed to the Spanish crown. Julius II., Pope.  1511. Council of Pisa.  1513. Pope Leo X. patron of literature and the arts.  1525. Spanish ascendancy by the victory of Pavia.  1540. Order of Jesuits founded by Loyola. 1545. Council of Trent.  1550. Julius III., Pope.  1559. Termination of French wars in Italy.  1569. Florence a grand duchy.  1585. Pope Sixtus V. restores the Vatican library.  1592. The Rialto and Piazza di San Marco built at Venice.	1509. Henry VIII., King.  1512. War with France.  1513. Battle of Flodden; James IV. killed. 1518. Wolsey, chancellor and cardinal.  1532. The King marries Anne Boleyn. 1535. Henry excommunicated by the Pope. 1543. Invasion of France. 1547. Formal establishment of Protestantism. Edward VI., King.  1553. Mary, Queen of England. 1554. Lady Jane Grey executed. 1555. Persecution of the Protestants. 1558. Elizabeth, Queen. Rise of the Puritans.  1568. Mary, Queen of Scots takes refuge in England.  1584. Raleigh's colony in Virginia. 1585. War with Spain.  1588. Spanish Armada destroyed.  1599. Troubles with Ireland.  1603. Union of England and Scotland.  1607. English settlement at Jamestown.  1617. Sir Francis Bacon, lord chancellor. 1620. Pilgrims sail in Mayflower.	1512. Maximilian divides the empire into 10 circles.  1517. Beginning of the Reformation.  1519. Charles V., King of Spain. 1521. Diet of Worms.  1529. Turks invade Germany.  1543. Alliance with England against France.  1551. Treaty of Passau secures religious liberty to the Protestants.  1556. Charles V. abdicates.  1564. Maximilian II., Emperor.  1576. Rudolf II., (King of Bohemia and Hungary), Emperor.  1594. Union of Protestants at Hildesheim.  1608. Protestant union under Frederick the Elector.	1506. Columbus dies at Valladolid.  1510. Council of Tours.  1515. Francis I. invades Italy.  1516. Charles, King of all Spain and the Netherlands. 1519. Conquest of Mexico by Cortes.  1521. First war with Charles.  1525. Francis defeated and taken prisoner at Pavia. 1527. Second war with Charles V. 1532-1544. Struggle for possession of Italy.  1547. Henry II., King; Catherine de' Medici, Queen.  1552. Fifth war with Charles V.  1562. Religious liberty granted to the Huguenots. Huguenot wars.  1572. Massacre of St. Bartholomew. 1576. The Catholic league. 1577. Sixth religious war.  1580. Portugal passes under Spanish dominion.  1588. Defeat of the Spanish Armada.  1598. Edict of Nantes—toleration granted to the Protestants.  1600. Expulsion of the Moors.  1601. Dutch war.	1562. Religious liberty granted to the Huguenots. Huguenot wars.  1572. Massacre of St. Bartholomew. 1576. The Catholic league. 1577. Sixth religious war.  1580. Portugal passes under Spanish dominion.  1588. Defeat of the Spanish Armada.  1598. Edict of Nantes—toleration granted to the Protestants.  1600. Expulsion of the Moors.  1601. Dutch war.
<b>1600-1700 A. D.</b> The Thirty Years' war, at first a life struggle of Roman Catholics and Protestants, results in downfall of Spain, and the ascendancy of France, which reached its zenith under Louis XIV. The battle of civil and religious liberty fought out in England under the Stuarts. Rise of modern science and philosophy.	1609. Leghorn becomes the emporium of the Levant trade.  1618. Conspiracy of Dr. Bedmar to subject Venice to Spain.	1617. Sir Francis Bacon, lord chancellor. 1620. Pilgrims sail in Mayflower.	1618. Thirty Years' war begins. 1620. Massacre of Prague.	1609. Expulsion of the Moors.  1601. Dutch war.	1610. Assassination of Henry IV.  1614. Last assembly of the states-general.

### AND RELIGIOUS WARS—Continued

RUSSIA	SCANDINAVIA	OTTOMAN EMPIRE	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
1510. Renewed Tartar invasions.		1505. War with Persia.	1506. Poland under Sigismund the Great.		<i>Poems of Vittoria Colonna.</i>
	1512. Christian II., King of Norway and Denmark.	1512. Selim I. dethrones and puts to death his father.	1511. Cuba conquered. 1512. Florida discovered.		
	1520. Christian, King of Sweden.	1514. Persians defeated; Kurdistan added to the empire. 1516. Cairo taken.	1513. Discoveries of Balboa.		
	1521. Gustavus Vasa throws off the Danish yoke. 1522. Gustavus Vasa, King of Sweden. Union of Calmar dissolved.	1520. Soliman the Magnificent, Sultan. 1521. Belgrade taken.	1517. First patent granted by Spain for the importation of negroes into America. 1519. Spaniards, under Cortes, conquer Mexico.	1517. Luther and the Protestant Reformation.	<i>Hans Sachs founds the German drama.</i>
1533. Ivan the Terrible, Czar.	1532. Union of Norway and Denmark.	1526. Invasion of Hungary. 1529. Invasion of Germany. Siege of Vienna.		1522. Circumnavigation of the globe by Magellan. Xavier plants Christianity in India.	
	1543. First standing army in Sweden.	1535. Barbarossa seizes Tunis. 1547. Turks invade Persia.	1533. Cortes conquers Peru.	1530. Jorgens invents the spinning wheel for flax.	<i>Calvin's Histories of Religion.</i>
1554. Siberia discovered.		1551. Tripoli taken. 1552. Invasion of Hungary.	1545. Mines at Potosi discovered.	1545. Vesalius makes important contributions to the study of anatomy. 1548. Orange trees introduced into Europe.	<i>Vasari's Lives.</i>
	1560. Eric XIV., King of Sweden.  War between Sweden and Denmark.	1559. Military power of the Turks at its greatest height under Soliman.  1570. War with Venice. 1571. Battle of Lepanto.	1556. Akbar raises the Indian empire to its greatest splendor.	1550. Carriage introduced into Paris. 1560. Knives first made in England.	<i>Cambré's Lunad.</i>  <i>Fox's Book of Martyrs.</i>
1571. Russia devastated by the Tartars, and Moscow burned.	1570. Peace of Stettin.		1564. Coligny sends a colony of Huguenots to Florida.		<i>Tasso's Jerusalem Delivered.</i>
1578. Alliance of Sweden and Poland against Russia.	1578. Alliance with Poland.	1589. Revolt of the Janissaries.	1578. Beginning of the Republic of Holland.  1585. Persia acquires great power under Abbas the Great.	1573. Titian, colorist painter, at height of fame.	<i>Ronsard's Poems.</i>
	1588. Christian IV., King of Denmark.	1593. Power in Hungary declines; revolt of Wallachia.		1586. Tobacco introduced into Europe. 1588. First newspaper in England. 1590. Telescopes invented by James, a German. Napier invents logarithms.	<i>Spenser's Faerie Queene.</i>  <i>Montaigne's Essays.</i>
1598. Boris Godunow begins a new dynasty.				1602. English East India Company founded.	<i>Shakespeare's Truama.</i>
	1604. Charles IX., King of Sweden.	1605. Revolt in Syria. 1606. Commercial treaty with France and Holland.	1605. Jehán Geer, Mughal emperor of India.	1606. Gilbert's electrical discoveries.	<i>Bacon's Essays.</i>
	1610. Gustavus Adolphus, King of Sweden.		1609. First English envoy of the East India Company sent to India.		
1612. Michael Fedorovich, Czar, founds the house of Romanoff.	1611. War between Sweden and Denmark.			1615. Coffee in Venice.	<i>Lope de Vega's Truama.</i>
1617. Finland ceded to Sweden.	1618. Sweden dominates the North.	1618. Great Persian victory at Shibli. 1620. War with Poland.		1618. Harvey discovers the circulation of the blood. 1620. Thermometers said to have been invented by Van Drebbel. Negro slavery begins in Virginia.	



## PERIOD OF THE REFORMATION

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	GREAT BRITAIN	GERMANY	SPAIN AND PORTUGAL	FRANCE
<b>1600—1700 A. D. Continued</b>	1626. St. Peter's dedicated. 1628. War following death of the Duke of Mantua. 1631. Influence of France increases.  1646. Revolt of Naples under Masaniello.	1625. Charles I., King. 1627. war with France.   1642. Civil war and revolution.	1628. Victories of Wallenstein. 1629. Gustavus Adolphus lands in Germany. 1632. Battle of Lützen.  1640. Frederick William of Prussia.  1648. Treaty of Westphalia.	1625. Naval war with England.   1639. Loss of the Japanese trade. 1640. Portugal regains independence.	1624. Ministry of Cardinal Richelieu. 1627. War with England over the Huguenots.  1638. Invasion of Spain. 1640. Turin taken by the French. 1643. Louis XIV., King. 1648. Wars of the Fronde.

## FROM THE PEACE OF WESTPHALIA TO

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	GREAT BRITAIN	GERMANY	SPAIN AND PORTUGAL	FRANCE
<b>1600—1700 A. D. Continued</b>		1649. Commonwealth under Cromwell. 1652. War with Holland. 1653. Cromwell, Lord Protector.  1660. Charles II., King. Stuarts restored. 1666. Great fire in London.  1668. Triple alliance of England, Sweden and Holland against France. 1670. War between Genoa and Savoy.  1676. Messina blockaded by the Dutch and Spanish fleets.  			

## 1700—1800 A. D.

ASTONISHING growth of the British empire. Government in England now and henceforth carried on by a Cabinet Ministry more or less representing the will of the people.

Development of manufactures in England. Inventions and discoveries. Immense advance in arts and sciences.

Independence of the United States.

Gross misgovernment of Roman Catholic Ireland by an English Protestant minority.

The French revolution which powerfully influences social, political, and intellectual progress for the next hundred years.

## AND RELIGIOUS WARS—Continued

RUSSIA	SCANDINAVIA	OTTOMAN EMPIRE	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
1632. War with Poland. Poles advance to Moscow.	1632. Christina, Queen of Sweden; Olofsstern, Regent.  1645. Peace between Sweden and Denmark.	1634. Murad invades Persia. 1637. Troubles on the Tartar frontier. Bagdad taken by the Turks.  1645. War with Venice.	1639. Great naval victory of Van Tromp, of Holland, over the Spanish fleet at the Downs. 1640. Madras, India, founded.	1626. Kepler's laws discovered.  1630. Gassette first published in Venice.  1639. Printing in America.  1640. Manufacturing in Sweden. 1643. Conde and Turenne the greatest generals of the time.	Grotius' treatises on law.

## THE DEATH OF LOUIS XIV. A. D. 1648-1715

RUSSIA	SCANDINAVIAN	OTTOMAN EMPIRE	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
1654. Russian victories in Poland.	1657. War between Denmark and Sweden. 1660. Arts and sciences flourish.	1657. Alliance with Sweden against Poland.  1661. War with Austria. 1662. Invasion of Hungary.	1653. John de Witt, Grand Pensionary of Holland.  1660. Sobieski, Polish general, wins great victory over the Tartars.	1654. Air pumps invented.    1666. Canal of Languedoc built. 1667. Gobelin tapestry manufactured in Paris.	Cornelle's <i>Tragedies</i> .  Milton's <i>Poems</i> .
1671. The Cossacks subjugated.	1680. Diet of Stockholm.	1672. Invasion of Poland.  1678. First war with Russia.	1674. Sobieski, King of Poland.	1671. Foundation of the Academy of Architecture at Paris.	Molière's <i>Dramas</i> .  Bunyan's <i>Pilgrim's Progress</i> .
1682. Ivan and Peter, Cæsar.	1693. The King of Sweden declared absolute.	1682. War with Austria. 1683. Defeat at Vienna. 1686. Russia declares war.	1686. Dekkan, India, conquered.	1681. Museum of Natural History founded in London. Jardin des Plantes founded at Paris.	Locke's <i>Essay</i> .  Boswell's <i>Sermons</i> . Racine's <i>Tragedies</i> .
1689. Peter the Great.	1699. Charles XII. begins to reign. Denmark, Poland, and Russia form an alliance against Sweden.	1687. Revolution in Constantinople, Solymán II. Sultan.  1690. Recovery of Belgrade from the Austrians.  1699. Peace of Carlowitz. The Ottoman power broken.	1690. Recovery of Belgrade from the Austrians. 1692. Mogul power at its height in India. Jesuits gain large influence in China. 1695. Brussels bombarded by the French.	1687. Telegraph invented.    1690. White paper first made in England. 1692. First opera in London. 1693. Bank of England founded.	Newton's <i>Principia</i> .
1692. First trade with China.	1700. Peter the Great wars with the Northern Powers.	1703. Mustapha II. deposed by the Janissaries.	1704. Stanislaus I., King of Poland.	1703. Russian newspaper established at St. Petersburg. Flourishing period of French literature.	Flourishing period of French literature.
1707. Revolt of the Cossack Masceppa. 1708. Charles XII. of Sweden invades Russia. 1709. Is defeated at Poltava.  1714. Finland conquered.	1702-1706. Charles XII. sweeps Poland and Russia.  1715. Charles returns to Sweden.			1709. Prussic acid discovered.  1714. Rise of commerce in Austria.	

## FROM THE DEATH OF LOUIS XIV. TO

CHARACTERISTICS OF THE CENTURIES	ITALY AND THE CHURCH	GREAT BRITAIN	GERMANY	SPAIN AND PORTUGAL	FRANCE
<b>1700-1800 A. D. Continued</b>  Napoleon's colossal power and downfall. Fall of despotisms; great political advance of European people. Continued rapid advancement of science, inventions and discoveries. Increased philanthropic effort and intellectual enlightenment.	1719. Sicily invaded by the Spanish.	1718. War with Spain.	1718. Quadruple alliance against Spain.		1718. The Quadruple alliance against Spain.
	1730. Clement XII., Pope.	1727. George II., King of England.			
	1744. Italy invaded by the French and Spaniards.	1739. War with Spain.	1733. War of the Polish succession.	1734. Conquest of Sicily and Naples by Don Carlos.	1733. The Polish succession involves France in war.
	1746. French and Spaniards driven from Lombardy.	1745. Troubles in Scotland.	1740. War of the Austrian succession. Maria Theresa succeeds in the hereditary states.		1740. The Austrian succession.
		1750. Alliance with Prussia.	1743. Francis I., husband of Maria Theresa, Emperor.	1746. Ferdinand VI., King.	1744. War with England and Austria.
		1762. War with Spain.	1756. Seven years' war—Austria and Prussia.		1747. War with Holland.
		1763. Peace of Paris.			1760. Loss of all Canada.
	1773. Jesuits expelled from Rome.	1775. War with the American Colonies.	1772. Dismemberment of Poland.	1767. Jesuits expelled from Spain.	1770. Marriage of the dauphin to Marie Antoinette.
		1776. British army takes possession of New York. Hessians hired for service in America.	1778. War of the Bavarian succession. Bavaria seized by Germany.		1774. Louis XVI., King.
	1782. Pontine marshes drained.	1781. Surrender of Cornwallis at Yorktown.			1776. Franklin in Paris.
<b>1800-1900 A. D.</b>  Napoleon's colossal power and downfall. Fall of despotisms; great political advance of European people. Continued rapid advancement of science, inventions and discoveries. Increased philanthropic effort and intellectual enlightenment.		1783. Treaty of Versailles. Independence of the United States acknowledged.	1788. The emperor tries to control the universities.		1778. Alliance with America.
	1796-1797. Napoleon's Italian campaign.	1793. First coalition against France directed by England.	1792. War with France.	1788. Charles IV., King.	1780. Rochambeau sent to aid the Americans.
	1798. Roman republic proclaimed by the French.	1797. Nelson destroys French fleet near Alexandria.	1793. First coalition against France.		1789. French revolution begins. Lafayette commander of the national guards.
	1802. Napoleon, President of the Italian Republic.	1798. Second coalition against France.	1797. Napoleon's Austrian campaign.		1792. War with Germany. France declared a republic.
	1805. Napoleon crowned King of Italy.	1800. Union of England and Ireland.			1793. King and Queen beheaded. Reign of Terror.
	1808. Rome annexed by Napoleon to the kingdom of Italy.	1803. Successful war in India.	1804. The emperor of Germany assumes the title of emperor of Austria. Battle of Austerlitz. Confederation of the Rhine.	1805. Battle of Trafalgar.	1796. Napoleon Bonaparte commands the army.
		1805. Napoleon defeated at Trafalgar.	1809. Peace of Vienna.	1806. Madrid taken by the French. Joseph Bonaparte, King.	1796. War in Italy.
		1806. Fourth coalition against France.	1812. Austria in alliance with France against Russia.	1812. Battle of Salamanca.	1797. Napoleon in Austria.
		1810. War with Sweden.	1813. War of German independence.		1798. Expedition to Egypt.
		1812. War with the United States.		1805. Battle of Austerlitz.	1799. Swiss campaign.
		1815. British defeated at New Orleans. Wellington victorious at Waterloo. The Allies enter Paris, and Napoleon is banished to St. Helena.	1815. German League. Congress of Vienna.	1807. War with Russia. Invasion of Portugal.	1800. Battle of Marengo.
	1814. Fall of Napoleon. Kingdom ceases.			1808. Battle of Wagram.	1802. Napoleon, President of the Italian republic.
				1812. Russian campaign.	1804. Napoleon I., Emperor of the French.
				1814. Ferdinand VII., restored.	1805. Battle of Austerlitz.
					1807. War with Russia. Invasion of Portugal.
					1800. Battle of Wagram.
					1810. Continental peace except with Spain.
					1812. Russian campaign.
					1814. Allies enter Paris. House of Bourbon restored.
					1815. Napoleon returns from Elba. Hundred days' war. Battle of Waterloo, and defeat of Napoleon. Abdication of Napoleon.

## THE FALL OF NAPOLEON, A. D. 1715-1815

RUSSIA	SCANDINAVIA	OTTOMAN EMPIRE	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
1721. Peter assumes the title "Emperor of all the Russias."	1718. Charles XII invades Norway and is killed at the siege of Frederikshall. 1720. Peace of Stockholm.	1717. Turks lose Belgrade.		1721. Inoculation for small-pox introduced.	Pope's <i>Poems</i> .
1727. Treaty with China.		1723. Turks and Russians attempt to dismember Persia.	1723. Christians expelled from China.	1728. Behring Strait discovered.	
1730. Peter II., last of the Romanoffs.	1730. Christian VI., King of Denmark.	1734. Turks driven from Persia by Nadir Shah. 1740. Renewed invasion of Turkey.	1733. Frederick Augustus II., King of Poland. 1739. India invaded by Nadir Shah, who takes Delhi.	1740. Irish linen manufactories and English steel and cutlery factories flourish.	
	1741. Swedes driven out of Finland.	1745. Defeat of Turks at Kaza.	1744. Hostilities between the French and English in India.		Hume's <i>History</i> .
1752. Catherine II. reigns.			1756. Calcutta taken by the Nabob of Bengal.	1750. Franklin's discoveries in electricity.	Voltaire's writings.
1758. War with the Ottoman Empire.			1765. Establishment of the English in India. 1766. Power of the Mamelukes revived in Egypt under Rodwan and Ali Bey.	1761. Potatoes first planted in France.	Franklin's <i>Poor Richard's Almanac</i> .
1774. Revolt of the Cossacks.	1773. Despotism re-established in Sweden by Gustavus III.		1774. Warren Hastings first governor-general of India.	1767. First spinning machine in England.	Lessing, Burke, Blackstone, Goldsmith, and Adam Smith.
			1776. Lord Pigot governor-general of the East Indies.	1774. Spinning-jenny invented by Arkwright. Steam engines improved by Watt and Bolton.	Kant's critical philosophy.
1787. War with the Turks.		1787. Disastrous war with Austria and Russia.			Gibbon's <i>History</i> .
	1792. Gustavus III. assassinated. Gustavus IV., King.		1794. Polish revolt at Cracow.		Burns' <i>Poems</i> .
1796. Unsuccessful war with Persia.			1797. Swiss revolution. Helvetic republic declared.		Schiller's works.
1801. Alexander, Czar.	1801. Denmark and Sweden accede to the alliance between England and Russia.	1803. Insurrection of Mamelukes at Cairo.		1801. Iron railways in England.	Goethe's <i>Dramas and Poems</i> .
1804. War with Persia.		1807. War against Russia and England.	1806. Louis Napoleon, King of Holland.	1807. Fulton invents the steamboat.	
1805. Russia joins the coalition against France.	1808. Finland invaded by the Russians.	1809. Romans defeated at Silistria.	1812. The Poles declared a nation by Napoleon. Diet of Warsaw.	1808. Lithography invented.	Cuvier's <i>Natural History</i> .
1807. Treaty of Tilsit.	1809. Charles XIII., King of Sweden.		American war with England.	1810. First steamboat built in Europe.	
1812. Invasion of Napoleon. Moscow burned.	1814. Union of Sweden and Norway as two kingdoms under one monarch.	1813. Servia invaded by Turkish army. 1814. Malta falls to England.		1814. Steam carriage in England. Gas used for lighting the streets in London.	
1815. The Holy Alliance formed.			1815. William I., King of the Netherlands.	1815. Safety lamp invented by Davy.	Wordsworth's <i>Poems</i> .

## FROM THE FALL OF NAPOLEON TO THE END

CHARACTERISTICS OF THE CENTURIES	UNITED STATES	GREAT BRITAIN	PRUSSIA	AUSTRIA	FRANCE
<b>1800-1900 A. D. Continued</b>	<p>1816. U. S. Bank incorporated.</p> <p>1817. James Monroe, President.</p> <p>1821. Monroe reelected.</p> <p>Missouri compromise bill passed.</p> <p>1824. Visit of Lafayette.</p> <p>1825. Erie Canal opened.</p> <p>Protective tariff enacted.</p> <p>J. Q. Adams, President.</p> <p>1829. Andrew Jackson, President.</p> <p>1831. Northeastern boundary between the U. S. and British provinces established.</p> <p>1833. President Jackson reelected.</p> <p>Bank deposits removed from the U. S. Bank.</p> <p>1837. Independence of Texas acknowledged.</p> <p>Martin Van Buren, President.</p> <p>1841. W. H. Harrison, President.</p> <p>Death of Harri-son, and succession of John Tyler.</p> <p>1845. Texas annexed to the U. S.</p> <p>Treaty with China.</p> <p>James K. Polk, President.</p> <p>1846. War with Mexico.</p> <p>The Oregon treaty with Great Britain, settling the northwestern boundary of the U. S.</p> <p>1848. Treaty of Guadalupe Hidalgo, ends Mexican war.</p> <p>Gold discovered in California.</p> <p>300,000 emigrants arrive this year.</p> <p>1849. Zachary Taylor, President.</p> <p>Railroad from Boston to New York.</p> <p>1850. Attempted invasion of Cuba by filibusters.</p> <p>Death of President Taylor.</p> <p>Millard Fillmore, President.</p> <p>Texas boundary settled.</p> <p>Fugitive Slave Law passed.</p> <p>1851. Erie railway opened.</p> <p>Charleston Convention.</p> <p>Vigilance committee organized in California.</p> <p>Komath arrives in New York.</p> <p>1853. Franklin Pierce, President.</p> <p>Gadsden Purchase.</p> <p>1854. Treaty with Japan.</p> <p>Kansas-Nebraska bill passed.</p> <p>Ostend Manifesto issued.</p>	<p>1816. Bombardment of Algiers. The Bey compelled to abolish slavery.</p> <p>1823. The Canning ministry.</p> <p>The Ashantees in Africa defeated.</p> <p>1829. Wellington ministry.</p> <p>Irish disturbances.</p> <p>1830. William IV., King.</p> <p>Difficulties with China.</p> <p>1837. Victoria, Queen.</p> <p>1840. War with China over the opium trade.</p> <p>War in Syria; Great Britain an ally of Austria and Turkey.</p> <p>1841. Chinese war ended.</p> <p>1844. Daniel O'Connell's trial. Sentence reversed by the House of Lords.</p> <p>1846. Repeal of the English corn-laws.</p> <p>1847. Severe famine in Ireland.</p> <p>1848. Civil war in Ireland.</p> <p>Habeas Corpus Act suspended.</p> <p>1849. Mooltan in India taken.</p> <p>1850. The war in Lahore ended.</p> <p>The Punjab annexed to the British Crown.</p> <p>Death of Sir Robert Peel.</p> <p>English forces defeated in South Africa by the Kafir.</p> <p>1851. Continuance of the Kafir war.</p> <p>Komath visits England.</p> <p>1853. Kafir war ended.</p> <p>Queen Victoria visits Ireland.</p> <p>1854. Crimean war.</p> <p>Treaty of alliance with France.</p>	<p>1818. The Zollverein formed.</p> <p>1819. Death of Marshal Blucher.</p> <p>1821. Congress of monarchs at Laybach.</p> <p>Insurrection in Moldavia and Wallachia.</p> <p>1829. Frederick William, King.</p> <p>1840. Frederick William, King.</p> <p>1848. Insurrection in Berlin.</p> <p>1849. The King declines the imperial crown.</p> <p>Armistice between Prussia and Denmark.</p> <p>1850. Hanover withdraws from the Prussian alliance.</p> <p>Hesse-Darmstadt withdraws.</p> <p>Treaty of peace with Denmark.</p> <p>New constitution for Prussia.</p> <p>1853. Plot to overthrow the government.</p> <p>1854. Treaty with Austria offensive and defensive.</p>	<p>1817. Population, 28,000,000.</p> <p>1818. Napoleon's son made Duke of Reichstadt.</p> <p>1821. Death of Napoleon at St. Helena.</p> <p>1824. Charles X., King.</p> <p>1830. Algiers taken by the French.</p> <p>Revolution and abdication of Charles X.</p> <p>Louis Philippe, King.</p> <p>1831. Abolition of hereditary peerage in France.</p> <p>1836. Insurrection attempted by Louis Napoleon at Strasbourg.</p> <p>1838. Death of Talleyrand.</p> <p>1844. War with Morocco.</p> <p>1847. Austria takes possession of Cracow.</p> <p>1848. Revolution in Hungary.</p> <p>Francis Joseph, Emperor.</p> <p>Kossuth withdraws his army from Vienna.</p> <p>1849. New Constitution promulgated.</p> <p>1850. Jerome Bonaparte, Field-Marshal.</p> <p>1851. Louis Kossuth sentenced to death at Pesth.</p> <p>1852. Emperor of Austria visits Emperor of Prussia.</p> <p>1854. Alliance with England and France.</p>	<p>1818. France joins in Holy Alliance.</p> <p>1821. Death of Napoleon at St. Helena.</p> <p>1824. Charles X., King.</p> <p>1830. Algiers taken by the French.</p> <p>Revolution and abdication of Charles X.</p> <p>Louis Philippe, King.</p> <p>1831. Abolition of hereditary peerage in France.</p> <p>1836. Insurrection attempted by Louis Napoleon at Strasbourg.</p> <p>1838. Death of Talleyrand.</p> <p>1844. War with Morocco.</p> <p>1847. Austria takes possession of Cracow.</p> <p>1848. Revolution in Hungary.</p> <p>Francis Joseph, Emperor.</p> <p>Kossuth withdraws his army from Vienna.</p> <p>1849. New Constitution promulgated.</p> <p>1850. Jerome Bonaparte, Field-Marshal.</p> <p>1851. Louis Kossuth sentenced to death at Pesth.</p> <p>1852. Louis Napoleon declared Emperor.</p> <p>1854. War declared against Russia.</p>

## OF THE AMERICAN CIVIL WAR, A. D. 1815-1865

SPAIN AND PORTUGAL	ITALY AND GREECE	RUSSIA	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
1815. Union of Portugal and Brazil under John VI.	1815. Kingdom of Two Sicilies restored.	1815. Poland united to Russia.	1816. Lord Amherst's unsuccessful mission to China.	1815. The abolition of the slave trade by the Congress of Vienna.	Scott's <i>Novels</i> . Byron and Shelley.
1817. Slave trade abolished.	1821. Austrian invasion of Italy.	1819. Establishment of military colonies. Liberty of the press in Poland nullified.	1817. The Mahratta power completely overthrown in India by the British.	1817. Public schools established in Russia.	Foote's <i>Tales</i> . Tegor's writings.
	1822. Greek revolution. Declaration of Independence.		1819. Bolivar, President of Colombia, South America. Peru and Guatemala independent. Brazil independent.	1819. The steamship "Savannah" makes the first trip across the Atlantic.	Hieroglyphics deciphered by Champollion.
	1825. Death of Ferdinand, after reign of sixty-six years.	1826. Nicholas I. crowned at Moscow. War against Persia.	1820. Misolonghi taken by the Turks.	1824. Inland navigation stimulated in the United States.	Vast increase in periodical literature in England, France, Germany, United States, etc.
1830. Salic law abolished.	1827. Treaty between Russia and Turkey respecting Greece.	1830. War against Poland.	1829. Venezuela independent.	1825. Steam navigation on the Rhine.	Balzac's <i>Novels</i> .
			1830. Polish struggles for nationality.		Poe's <i>Poems and Tales</i> . Hawthorne's writings.
	1832. Kingdom of Greece founded.	1832. Poland made part of empire.	1831. Leopold I., King of the Belgians.	1832. Trades unions in Europe.	
1833. Isabella II., Queen of Spain. Don Carlos claims the throne. Portugal a constitutional monarchy.			1833. Santa Anna, President of Mexico.		Emerson's <i>Essays</i> .
1837. The monasteries in Spain dissolved.		1838. Smuggling carried on extensively.	1836. Decree to expel all British and other foreigners from China.	1836. Founding of the Smithsonian Institution, Luxembourg erected, Paris.	
			1839. Turkey at war with Egypt.	1837. Morse patents the telegraph invented by him in 1842.	
			1840. William I. abdicates as King of Holland.	1840. Wheatstone's telegraph patented in England.	
1842. Insurrection in Barcelona.	1843. King Otto of Greece compelled to accept a constitution.	1845. Emperor visits England.	1842. Insurrection in India.	1845. Lord Rosse's telescope completed. Galia percha used.	Victor Hugo's works.
1846. Marriage of Isabella to the Duke of Cadix. Civil war in Portugal.			1847. Roulouque, President of Hayti.	1847. Great canal from the Danube to Marsedice completed. Railroad building in Germany. Sewing machine invented and patented.	Longfellow's <i>Poems</i> .
	1848. Rising of the great Italian cities in revolution. Italian revolution. Roman republic overthrown.	1849. Aide Austria to subdue Hungary.	1848. Holland receives a constitution. Insurrection in Ceylon. Hungary declared independent.	1848. Girard College opened.	
	1849. Catania, Syracuse, and Palermo taken by assault. Mazzini's proclamation of provisional government. Victor Emanuel, King. Rome surrenders to the French; Garibaldi leaves city. Bourbon rule begins.	1850. Harbor of Sebastopol completed.	1850. Death of Emperor Taikwang of China. Battle of Idstedt, Prussia.	1849. Tubular bridge at Anglesea, England. Magnetic clock invented by Dr. Locke of Cincinnati.	Darwin, Tennyson, Dickens, and Browning.
				1850. Great agitation on slavery in United States. The Peking Monitor a new paper, printed in China. Woman's Rights convention at Worcester, Mass.	
1851. Death of Godoy, "Prince of Peace."			1851. Discovery of gold in Australia. Disturbances in south of China.	1851. Daguerre makes important contributions to photography. Railway between Moscow and St. Petersburg opened.	George Eliot, Lowell, and Ruskin.
			1852. Buence Arroz taken by the liberating army. War between the Turks and Montenegro.	1852. Telegraph across the English channel.	
		1853. War declared against Turkey.	1853. Turkish-Russian War.	1853. First Norwegian railway opened. Perry's expedition to Japan.	
1854. Military insurrection under O'Donnell.		1854. War with France and England. Siege of Sebastopol. Battle of Balaklava.		1854. Commercial treaty between United States and Japan. First railway in Brazil.	

## FROM THE FALL OF NAPOLEON TO THE END

CHARACTERISTICS OF THE CENTURIES	UNITED STATES	GREAT BRITAIN	PRUSSIA	AUSTRIA	FRANCE
<b>1800-1900 A. D. Continued</b>	<p>1855. Panama Railroad completed. Troubles in Kansas.</p> <p>1857. Dred Scott decision. James Buchanan, President. Great financial panic.</p> <p>1859. John Brown captures Harpers Ferry.</p> <p>1860. South Carolina passes ordinance of secession.</p> <p>1861. Secession of Southern States, and establishment of the Confederate States under Jefferson Davis. Opening of the Civil war, 1861-1865. Abraham Lincoln, President.</p> <p>1865. Assassination of President Lincoln; Andrew Johnson, President.</p>	<p>1855. British fleet bombards and partially destroys Canton, China.</p> <p>1857. Rebellion in India begins. King of Delhi proclaimed Sovereign of India.</p> <p>1858. Completion of the Atlantic telegraph cable.</p> <p>1860. Rebellion in India subdued. Neutrality proclaimed during the American Civil war.</p> <p>1865. Fenian outbreaks in Ireland.</p>	<p>1861. William I., King.</p> <p>1862. Bismarck, Premier.</p> <p>1863. King resolves to govern without parliament.</p> <p>1864. War with Denmark.</p>	<p>1856. Hungarians granted amnesty.</p> <p>1859. War with France and Sardinia. Austrians defeated at Montebello. Peace after Battle of Solferino. Death of Prince Metetrich.</p> <p>1861. New constitution for the Austrian monarchy. Civil and political rights granted Protestants.</p> <p>1862. Amnesty to political offenders in Hungary.</p> <p>1864. Alliance with Prussia against Denmark.</p>	<p>1856. Peace with Russia.</p> <p>1859. War with Austria.</p> <p>1860. Commercial treaty with England.</p> <p>1862. Great distress caused by American Civil war.</p> <p>1863. The French occupy Mexico.</p> <p>1864. Maximilian accepts Mexican crown.</p> <p>1865. Death of Frodoon.</p>

## FROM THE END OF THE AMERICAN CIVIL

CHARACTERISTICS OF THE CENTURIES	UNITED STATES	GREAT BRITAIN	PRUSSIA	AUSTRIA	FRANCE
<b>1800-1900 A. D. Continued</b>	<p>1866. Civil rights bill passed. Atlantic telegraph completed.</p> <p>1867. General amnesty proclamation.</p> <p>1868. Burlingame treaty with China.</p> <p>1869. U. S. Grant, President. Union Pacific railway opened for traffic.</p> <p>1877. R. B. Hayes, President.</p> <p>1881. James A. Garfield, President. President Garfield assassinated, July 24; Chester A. Arthur, President.</p> <p>1885. Grover Cleveland, President. Apache Indian War.</p> <p>1889. Benjamin Harrison, President. Johnstown Flood.</p>	<p>1865. British and French governments rescind their recognition of the Confederate States of America.</p> <p>1870. Irish Land Act passed.</p> <p>1873. Payment of Alabama claims to the United States.</p> <p>1876. Queen Victoria proclaimed Empress of India.</p> <p>1882. Attempt on life of Queen Victoria.</p> <p>1887. Queen's Jubilee.</p> <p>1889. Great labor strikes.</p>	<p>1866. Prussia prepares for war with Austria. Battle of Sadowa. Hanover annexed. First parliament of the German Confederation.</p> <p>1867. North German Constitution accepted.</p> <p>1870. War with France. Battle of Sedan.</p> <p>1871. King of Prussia proclaimed Emperor of Germany.</p> <p>GERMANY</p> <p>1871. William I., Emperor.</p> <p>1877. Attempted assassination of emperor.</p> <p>1888. Accession and death of Frederick III, William II., Emperor.</p>	<p>1866. War with Prussia and Italy.</p> <p>1867. Autonomy for Hungary announced. Emperor crowned King of Hungary.</p> <p>1870. Concordat with Rome suspended.</p> <p>1871. New German empire recognized.</p> <p>1878. Occupation of Bosnia.</p> <p>1882. 600th anniversary of the House of Habsburg.</p> <p>1886. Army put on war footing of 1,500,000 men.</p>	<p>1867. Great exposition in Paris.</p> <p>1869. New constitution promulgated.</p> <p>1870. War declared against Prussia. Battle of Sedan. Surrender of Metz.</p> <p>1871. Capitulation of Paris. Peace ratified.</p> <p>1873. Marshal MacMahon, President.</p> <p>1874. Death of Guizot.</p> <p>1879. Jules Grevy, President.</p> <p>1887. Sadi-Carnot President.</p>

## OF THE AMERICAN CIVIL WAR—Continued

SPAIN AND PORTUGAL	ITALY AND GREECE	RUSSIA	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
	1855. Important concordat between Italy and Austria.	1855. Death of Nicholas I. Alexander II., Emperor.	1855. Santa Anna abdicates the presidency of Mexico.	1855. Panama Railroad completed. Bessemer's steel process patented.	Spencer's <i>Philosophy</i> .
		1856. Destruction of Sebastopol docks. Evacuation of Crimea.		1856. Submarine telegraph laid from Cape Breton to Newfoundland.	
		1858. Partial emancipation of the serfs.	1858. Massacre of Christians in Turkey. Suez Railroad completed.	1858. Great Eastern launched at London. Laying of the Atlantic cable. Boston Public Library opened.	
1859. War with Morocco.	1859. War with Austria.			1859. Telegraphic communication between India and England.	Huxley, Hens, and Dumas.
1860. Defeat of the Moors.	1860. Garibaldi lands in Sicily, and assumes dictatorship. Sicily and Naples liberated.				
1861. Annexation of Santo Domingo, intervention in Mexico.	1861. Victor Emmanuel King of Sardinia, first King of Italy.		1861. Canton restored to the Chinese by the French and English.	1861. International exhibition at London.	
	1862. Garibaldi establishes a provisional government. Insurrection in Greece.	1862. Nemelrode, Chancellor.		1863. Abolition of slavery in the United States.	Blackmore's <i>Lorna Doone</i> .
1864. Rupture with Peru.	1864. Florence made the capital of Italy.	1864. Emigration of Caucasian tribes into Turkey.	1864. Nankin, China, taken by Gordon for the Imperialists. Valparaiso bombarded by Spanish fleet.	1864. Convention between France, Brazil, Italy, Portugal, and Spain for telegraph to America.	
1865. Dispute with Chile.	1865. Ionian Isles made over to Greece.				

## WAR TO THE PRESENT TIME—A. D. 1865-

SPAIN AND PORTUGAL	ITALY AND GREECE	RUSSIA	LESSER COUNTRIES	ARTS, SCIENCES, ETC.	LITERATURE
1866. Military insurrection headed by General Prim.	1866. Austria war, Venetia proclaimed a part of Italy.	1866. Inauguration of trial by jury. War with Bokhara.		1866. Atlantic telegraph successfully completed.	Meredith, Taine, Arnold, Wallcut.
1867. Death of Marshal O'Donnell.	1867. Garibaldi and the Papal states.	1867. Russian America sold to the United States.	1867. City of Mexico evacuated by French troops. Egypt declared by the Sultan to be a separate sovereignty. Execution of Maximilian in Mexico.	1867. Great exposition at Paris.	
1868. Queen deposed.	1869. Vatican Council opened at Rome.		1870. Fenian raid in Canada.	1868. Suez canal formally opened.	
1870. Isabella II., abdicates; Amadeus, king.	1870. Rome is annexed to Italy. Declared the capital of Italy.	1871. Electric telegraph between Russia and Japan.	1871. Military revolt in City of Mexico suppressed.	1869. French Atlantic telegraph completed.	
1871. Sagasta, Prime Minister.	1882. Death of Garibaldi.	1873. Khiva captured.	1872. Attempt to assassinate the Mikado of Japan.	1870. Railway from Calcutta to Bombay. Mont Cenis tunnel completed.	
1874. Alfonso XII., King.			1874. Insurrection at Nagasaki, Japan.	1873. European calendar introduced into Japan.	
1875. Civil war.				1876. Railway open between Quebec and Halifax. Centennial Exposition at Philadelphia.	
	1878. Death of Victor Emmanuel II. Humbert, King. Death of Pius IX. Leo XIII., Pope.	1877. War against Turkey. 1878. Spread of Nihilism in the empire. 1880. Many Nihilists imprisoned and executed. 1881. Alexander II. assassinated. Alexander III., Emperor.	1878. Montenegro, Servia and Roumania independent.	1877. Telephone invented by Bell.	Ibsen, Tolstol, Bjornson.
1883. Sagasta again Minister.	1885. War with Abyssinia.	1885. Ship canal from St. Petersburg to Cronstadt opened. Trouble with the Afghans. 1886. Russia interferes in Bulgaria.	1883. Opening of the St. Gothard Railway from Milan to Luernne.	1883. First electric street railway in United States at Baltimore.	
	1887. Alliance of Italy with Austria-Hungary and Germany signed. Crispi, Prime Minister.	1888. Central Asian railway opened.	1886. Upper Burmah annexed to British India.	1885. Revised version of Old Testament published.	
1889. Trial by jury first put in force.			1889. New constitution promulgated in Japan.	1887. Great railway bridge at Iachine, Canada, completed. 1888. Typetting machines perfected. Pasteur discovers cure for hydrophobia.	



## FROM THE END OF THE AMERICAN CIVIL

CHARACTERISTICS OF THE CENTURIES	UNITED STATES	GREAT BRITAIN	GERMANY	AUSTRIA	FRANCE
<b>1800-1900 A. D. Continued</b>	1800. McKinley tariff bill passed.	1800. Stanley returns from Africa.	1800. Resignation of Bismarck as chancellor. 1801. Triple Alliance renewed.	1801. Renewal of Triple Alliance.	1800. War with Dahomey. 1802. Panama scandal.
	1893. Grover Cleveland, President. Chinese exclusion bill approved. World's Columbian exposition at Chicago.	1893. Behring Sea arbitration. 1894. Manchester ship canal opened.	1893. Anti-Jesuit law repealed. 1894. Commercial treaty with Russia. New parliament house opened.	1894. Commercial treaty with Russia ratified.	1894. President Carnot assassinated at Lyons. M. Casimir-Perier, President. Captain Dreyfus tried and imprisoned. 1895. President Casimir-Perier resigns. M. Félix Faure, President. Death of Pasteur.
	1897. William McKinley, President. Hawaii annexed.	1897. Blackwell tunnel opened. The Queen's Diamond Jubilee celebrated.	1895. North Sea and Baltic canal opened. Restrictions imposed on American insurance companies. 1896. New civil code for the empire completed.	1895. Anti-Semitic agitation. 1896. Archduke Karl Ludwig, heir to the throne, dies. Millennial exposition at Budapest.	1897. Ten-hour law for railway employes passed.
	1898. Destruction of the <i>Maine</i> at Havana. War with Spain.	1898. Death of Gladstone. Irish local government bill passed. Imperial penny-postage goes into effect.	1898. Death of Bismarck. Emperor visits Constantinople and Jerusalem.	1898. Assassination of the Empress by an anarchist at Geneva.	1898. Review of Dreyfus case granted.
	1899. Cuba passes into American possession. Philippines and Porto Rico acquired.	1899. The Boer war in South Africa.			
	<b>1900-1911 A. D.</b>	1900. Field-Marshal Roberts takes command in South Africa.	1900. Abolition of the Roman law throughout Germany.	1900. Marriage of the heir apparent, Francis Ferdinand.	1901. Diplomatic relations with Turkey suspended.
	Japan becomes a world power. Constitutional and representative government is extended in many parts of the world—notably in Russia, Persia, Turkey, China and Portugal.	1901. The Platt amendment effecting Cuban independence. Capture of Aguinaldo. Death of Ex-President Harrison.	1901. Census of the Indian empire taken. Death of Queen Victoria and accession of Edward VII.	1901. Bicentenary of the coronation of the first king of Prussia.	1902. M. Combes forms a new French ministry.
	Renewed impulse given to international peace and arbitration.	1902. Cuban independence under Platt amendment. President Roosevelt recommends the purchase of the Panama Canal company.	1902. Prince Henry of Prussia visits the United States. Marquis of Salisbury resigns as premier.	1902. Triple Alliance renewed. The language question between Germany and Czechs.	1903. Dreyfus case reopened. President Loubet visits King Edward.
	Great commercial expansion in Germany, France, Japan, Great Britain and the United States.	1903. Panama canal treaty signed with Colombia. Commercial treaty with China signed. Independence of Panama recognized.	1903. King Edward visits the King of Italy. Irish land bill passed the House of Parliament.	1903. New tariff bill. Visit of the Czar of Russia.	1904. Arbitration treaties with Holland, Spain, Sweden, Norway, and the United States. Bill for separation of church and state introduced.
	Unprecedented power of the public press. Era of educational and social philanthropies. Decline in creative literature. Development of African resources.	1904. Great Baltimore fire. U. S. Senator Burton convicted of malfeasance in office. St. Louis exposition opened.	1904. Col. Younghusband enters Tibet.	1904. Ultimatum to the Sultan issued. Great railway strike.	1904. The Moroccan situation grows in complexity.
	1905. Protocol with Santo Domingo.	1905. Resignation of Lord Curzon as viceroy of India.	1905. Intervention of Germany in Moroccan affairs. The new commercial treaties. Marriage of the crown prince.	1905. Treaty with Germany ratified. Universal suffrage on an educational basis advocated.	1906. M. Fallières, President. The church controversy. The Pope's encyclical. M. Sarrien, Premier.
	1906. Riot at Brownsville, Texas. The President visited Panama. Great earthquake at San Francisco.	1906. King Edward visits Paris.	1906. Propaganda against Socialism.	1906. Prince Schillingfurst succeeds Baron Gautsch.	
	1907. Philippine assembly opened.	1907. King Edward and Emperor Francis Joseph meet at Ischi.	1907. German emperor visited London.	1907. Universal suffrage bill passed.	1907. Wine growers' agitation. French occupation of Morocco.
	1908. Voyage of the Pacific fleet to Asiatic waters. 1909. Tariff revised.		1910. Emperor William received Ex-President Roosevelt.	1909. Bosnia and Herzegovina acquired.	1910. Briand cabinet resigned.
	1910. Elections result in great Democratic gains.	1910. Death of King Edward VII. Accession of George V.			
	1911. Extra session of Congress called by President Taft.	1911. King George formally opens the British Parliament.	1911. The Emperor urged a policy of reclamation.	1911. Austria strengthens her army and navy.	1911. New ministry formed by Poincaré.

## WAR TO THE PRESENT TIME—Continued

SPAIN AND PORTUGAL	ITALY AND GREECE	RUSSIA	LESSEE COUNTRIES	ARTS, SCIENCE, ETC.	LITERATURE
1890. Castiello, Premier.	1891. Treaty of Italy with Great Britain relative to East Africa. Triple Alliance renewed. 1893. Pope's Jubilee at Rome.	1890-1892. Famine through the empire. 1894. Death of Alexander Nicholas II., Czar.	1890. First Japanese Parliament opened. 1893. Krüger, President of the Transvaal. 1894. War between China and Japan.	1890. Polygamy abolished in Utah. 1891. Canadian Pacific railway completed. 1893. World's parliament of religions at Chicago. Electrical measurements established.	Hardy's <i>Novels</i> .  Bruden's <i>Essays</i> .
1893. War with Morocco.	1896. (Italy) Peace with Abyssinia.	1895. Diplomatic relations with Abyssinia. Persecution of the Jews. 1896. First official census of the empire. 1897. Judicial reform in Siberia.	1895. Cecil Rhodes a power in South Africa. Federation of Australia approved. Congo State annexed to Belgium. 1896. Jameson raid in South Africa. 1897. Turko-Grecian war.	1895. Great refracting telescope made by Clark for Lick observatory. Discovery of Roentgen rays. 1897. Universal postal congress at Washington.	Mitchell's <i>Novels and Poems</i> .
1897. Assassination of Premier Canovas del Castillo. Scheme of Cuban autonomy approved. 1898. Spanish-American war. Treaty of Paris.	1898. Pope offers to mediate in the Cuban question.	1898. Port Arthur leased from China.	1898. Hawaii annexed to the United States. Switzerland votes to take over railroads within her borders. Wilhelmina, Queen of Holland.	1898. Reform edict issued in China.	James' <i>Novels</i> .
1899. Death of Premier Canovas of Spain.	1900. Assassination of King Humbert of Italy. Victor Emmanuel III., King.	1899. Czar proposes universal peace. 1901. Count Tolstoi excommunicated.	1899. Venezuela-Guiana boundary line established. 1900. Outbreak of the Boxers in China.	1899. The "open-door" policy for China agreed to. Jubilee of the year 1900 proclaimed by the Pope. 1900. Opening of the Elbe and Trave canal, Germany.	Howell's <i>Novels</i> .  Kipling's <i>Stories and Poems</i> .
1902. Alfonso XIII., King.	1903. Death of Pope Leo XIII. Pope Pius X.		1901. Submission of China to the allied powers. Inauguration of the federal government of the Commonwealth of Australia. 1903. Peter I., King of Serbia.	1902. Marconi wireless system established on Italian warships. 1903. Completion of the Pacific cable. Message sent around the world in twelve minutes.	Lagerlöf's <i>Novels</i> .
1904. Death of Es-Queen Isabella at Paris.	1904. King and Queen of Italy visit England.	1904. War with Japan over Manchuria begun.	1904. President Diaz of Mexico re-elected. Death of Paul Krüger, in Switzerland.	1904. New York subway opened.	Zangwill's <i>Novels</i> .
1905. Attempted assassination of the King in Paris.	1905. The railway bills passed in Italy.	1905. Fall of Port Arthur, and end of war. Great railway strike at St. Petersburg, Warsaw, and Moscow. Constitution granted by Czar, and the Duma authorized.	1905. Fall of Port Arthur, and end of war. Great railway strike at St. Petersburg, Warsaw, and Moscow. Constitution granted by Czar, and the Duma authorized.	1905. Gigantic power plants erected at Niagara falls.	Stockiewicz's <i>Novels</i> .
1906. King Alfonso married to Princess Victoria of England.	1906. Sonnino, Premier. International exhibition at Milan.	1906. The Czar opened the first Russian Duma. Premier Stolypin killed by explosion of bomb.	1906. Death of King Christian of Denmark. Norway and Sweden independent kingdoms. Emperor of China promises constitutional government. President Palma of Cuba resigns. The Shah opened the first Persian Parliament. 1907. Abdication of Korean emperor. Death of Oscar II. of Sweden.	1906. The Simplon tunnel opened. Pan-American conference meets at Rio de Janeiro. Moroccan conference at Algiers. Wireless telegraphy conference at Berlin.	Phillips' <i>Poems</i> .
1907. King and Queen visit England.	1907. Italy signs arbitration treaty with Argentina.	1907. Third Russian Duma convened.		1907. The <i>Lusitania</i> makes her first voyage.	
1910. Spain recalled its envoy to the Vatican. Portugal becomes a republic. 1911. Further creation of religious orders prohibited.	1910. Decree issued by the King of Greece for a revision of the constitution. 1911. Second parliament assembled.	1910. Death of Count Tolstoi. 1911. Russian army mobilized on Chinese frontier.	1910. Montenegro became a kingdom with Nicholas king. Revolutionary outbreaks in Mexico. Japan annexed Korea. 1911. Renewed insurrections in Mexico. President Diaz forced to resign; provisional government instituted.	1908. Discoveries in the transmutation of metals. 1909. Great progress in aeronautics.	Leakshire's <i>Essays</i> .

## PARALLEL OUTLINES OF AMERICAN HISTORY

## I. PREHISTORIC PERIOD, B. C. 955-1492 A. D.

955. Civilization of aborigines of Mexico and Central America begun by the advent of Yotan.
800. Zama introduced the Maya civilization, and founds Mayapan, capital of what is now Yucatan.
476. Piria dynasty probably begins in Peru. The Toltecs arrive in Mexico and Central America about the Christian era, and displace the previous government.
- A. D.
503. Mexican history begins according to Itzlihoehitl.
600. Toltecs established the first empire.
830. Piria dynasty declines in Peru.
961. Iceland discovered by Nadod, a Norse rover.
875. First settlement by Norsemen.
876. Grumbrion sights a western land.
982. Land discovered by Eric the Red, and named Greenland.
983. Second voyage from Iceland to Greenland by Eric.
985. Bjarni sails from Iceland for Greenland, but is driven south by a storm and sights land at Cape Cod or Nantucket, also at Newfoundland, and returns to Greenland.
1000. Voyage of Leif, son of Eric the Red. He sails in one ship with 35 men in search of the land seen by Bjarni.
1001. Touching the Labrador coast, he stops near Boston, Mass., or farther south, for the winter. He loads his vessel with timber, and returns to Green-

- land in the spring. He calls the land Vinland, from its grapes.
1002. Thorwald, Leif's brother, visits Vinland in 1002, and winters near Mt. Hope bay, Rhode Island. In the spring of 1003 he sent a party of his men to explore the coast, perhaps as far south as Cape May.
1004. Thorwald explores the coast eastward, and is killed in a skirmish with the natives somewhere near Boston.
1005. His companions return to Greenland.
- 1007-8. Thorfinn Karlsefne sails with three ships and 160 persons (five of them young married women) from Greenland to establish a colony. Landing in Rhode Island, he remains in Vinland three years.
1050. End of the Toltec power in Mexico.
- 1121-47. Icelandic manuscripts mention a bishop in Vinland in 1121, and other voyages there in 1122, 1135 and 1147.
1240. Inca's rule begins in Peru.
1350. Rise of Aztec power, and founding of City of Mexico.
1347. Latest tidings of Vinland.
1349. Sciregur appear in Greenland.
1350. Communication with Greenland ceases.
1402. Seigneur Jean de Béthencourt settles the Canary Islands.

Hieroglyphic documents containing traditions of the pre-Toltec or Yotan period, said to have been publicly destroyed by Francisco Nuñez de la Vega, bishop of Chupaa, in 1691.

## II. PERIOD OF AUTHENTIC DISCOVERY AND EXPLORATION, 1492-1607 A. D.

MONARCHS OF SPAIN	EXPLORATION	MONARCHS OF ENGLAND	EXPLORATION	MONARCHS OF FRANCE
1474-1516. Ferdinand and Isabella.	1492. Columbus sailed, on his first expedition, from Palos, in Andalusia, on Friday, with three vessels, supplied by the sovereigns of Spain—the Santa Maria, a decked vessel, with a crew of fifty men, with Columbus in command; and two caravels—the Pinta, with thirty men, under Martin Alonso Pinzon; and the Nina, with twenty-four men, under Vicente Yañes Pinzon, brother of Martin. He discovered a small island of the Bahama group, October 12; Cuba, October 26; and Hispaniola (now Hayti), where he builds a fort, La Navidad, December 6.	1483-1509. Henry VII.	and called the country New France. He anchored between the mouth of Cape Fear river and Pamlico sound, at New York, Newport, and on the New England coast.	1483-1498. Charles VIII.
	1493. Columbus sails for Spain in the Nina, the Santa Maria having been abandoned; sails from Cadiz on his second expedition.	1524. Stephen Gomez, a Portuguese navigator sent out by the Spanish government, explored the coast from Maine to Florida.	1525. Expedition of de Ayllon under Pedro de Quezco explored the coast 250 leagues north of St. John, taking land in name of Charles V.	
	1494. Discovers Jamaica, May 3; and Evangelista (now Isle of Pines), June 13, war with the natives of Hispaniola.	1526. Vaquez de Ayllon sailed to the Chesapeake, where he made a settlement, San Miguel de Guanapoco.	1527. Captain John Rut of England coasted as far as South Carolina.	
	1495-6. Vista various islands, and explores their coasts.	1527. Pedro de Narvaez received a patent from Charles V. styling him governor of Florida, Rio de Palmas, and Espiritu Santo (the Mississippi).	1527. Antonio Nufes Cabeza de Vaca found the River Citia in New Mexico having been lost by the Narvaez expedition.	1498-1515. Louis XII.
	1496. Returns to Spain to meet charge; reaches Cadiz.	1528. Panfilo de Narvaez in April arrived at Tampa bay, Florida, having the year before been appointed governor by Charles V.	1528. Alvaro Nufes Cabeza de Vaca crossed the mouth of the Mississippi.	
	1497. John Cabot discovers the North American continent.	1529. Hernando de Soto, with his expedition, landed at the Bay Espiritu Santo, taking formal possession of the land in the name of the King of Spain.	1530. Fra Marcos de Niza (de Nier), a monk, took possession of the land of the Seven Cities in the name of the vicerey and governor of New Spain, on behalf of the emperor, giving the name of the New Kingdom of St. Francis.	
	1498. Columbus sails with six ships on his third voyage, May 30; discovers Trinidad; July 31; lands on terra firma without knowing it to be a new continent, naming it Isla Santa; discovers the mouth of the Orinoco.	1540. Hernando Alarcon ascended the Colorado from the Gulf of California.	1542. Jean Alfonse, a native of Cognac, France, entered Massachusetts bay.	
	1499. Alonso de Ojeda discovers Surinam, June; and the Gulf of Venezuela. Amerigo Vesputi accompanies him on this voyage.	1543. Juan Rodriguez Cabellero, a Portuguese in the Spanish service, explored the Pacific coast as far as Cape Mendocino.	1543. Juan Rodriguez Cabellero, a Portuguese in the Spanish service, explored the Pacific coast as far as Cape Mendocino.	
	1500. Vicente Yañes Pinzon discovers Brazil, January 20; and the river Amazon. Gaspar Cortesal, in the service of Portugal, discovers Labrador.	1549. Father Luis Cancer de Barbastro, a Dominican, under Spanish direction, reached the coast of Florida.	1558. Guido de Lahaaraz visited Pensacola bay in the interest of Spanish settlements.	
	Francisco de Bobadilla appointed governor of Hispaniola, and leaves Spain; Bobadilla arrests Columbus on his arrival at Hispaniola, and sends him to Spain in irons. He is received with honor at court, and the charges dismissed without inquiry.	1559-1547. Henry VIII.	1561. Angel de Villafra reached Santa Elena, now Fort Royal sound, South Carolina. Subsequently doubled Cape Hatteras.	
	1501-3. Amerigo Vesputi on the South American coast.	1547-1553. Edward VI.	1562. Jean Ribault, commanding a number of French Protestants (Calvinists), took possession of Fort Royal—Santa Elena—and founded Charlefort. This was the earliest attempt at settlement as distinct from exploration.	1515-1547. Francis I.
	1502. Columbus sails, on his fourth and last voyage, with four caravels and 150 men, from Cadiz; discovers the island of Martinique; discovers various islands on the coast of Honduras, and explores the coast of the isthmus.	1553-1558. Mary.	1563. René Goulaine Laudonnière made a Huguenot settlement at the mouth of the St. John's river, near Fort Caroline.	1547-1559. Henri II.
	1504. Columbus finally leaves the new world for Spain.		1565. Pedro Menendez de Aviles made the coast of Florida near Cape Canaveral, to drive out the French.	1559-1560. Francis II.
	1509. Francisco Pizarro reaches Darien.		1566. John Hawkins, of England, passed along the whole coast of Florida, being the first Englishman to give any account of the country.	1560-1574. Charles IX.
	1510. Alonso de Ojeda founds San Sebastian, the first colony in south America.		1565. Menendez discovered and named the harbor of St. Augustine, where he remained, ultimately taking possession of the land in the name of Philip II, King of Spain.	
1516-1556. Charles I.	1511. Diego Hernandez de Córdoba landed on the Havana.		1566. Captain Juan Pardo penetrated to the region of the Cherokee—Florida.	
	1512. Juan Ponce de León, in the interest of Spain, discovered the mainland; he landed and took possession in the name of the King of Spain (Florida).			
	1517. Francisco Hernandez de Córdoba landed on the Florida coast.			
	1519. Francis de Garay discovered the Mississippi, naming it Rio del Espíritu Santo.			
	1520. Lucas Vázquez de Grijalva (Spanish) entered St. Helena sound, South Carolina, and anchored at the mouth of the Combahee river. The country was named Chicora; the river, Jordan.			
	1521. Francisco Hernandez de Córdoba the expedition of Lucas Vázquez de Grijalva, arrived on the Florida coast.			
	1522. Overthrow of Aztec power by Spaniards under Cortes.			
	1524. Giovanni da Verrazano (John Verrazano), in the service of Francis I., King of France, coasted between the 28th and 50th degrees of north latitude.			

## II. PERIOD OF AUTHENTIC DISCOVERY AND EXPLORATION—Continued

MONARCHS OF SPAIN	EXPLORATION	MONARCHS OF ENGLAND	EXPLORATION	MONARCHS OF FRANCE
1550-1598. Philip II.	1567. Dominique de Gourgues, with a French expedition of three ships, arrived in April to avenge the death of Ribault. He assaulted and took the Spanish forts, numbers.	1558-1603. Elizabeth.	Dartmouth, England, sighted the coast of Maine near Casco Bay, calling the place Northland, exploring Cape Cod, Martha's Vineyard, south to Cuttyhunk.	1574-1598. Henry III.
	1570. Menendez established a mission under Father Segura on the Chesapeake bay waters, probably the Rappahannock.		1602. Sebastian Vizcaino, coast of California.	
	1579. Francis Drake took possession of New Albion (California) in the name of Queen Elizabeth.		1603. Martin Pring, of England, sighted the islands of Maine and Massachusetts bay, entering the present harbor of Portland.	
	1584. Raleigh's expedition under the charter of Queen Elizabeth, in command of Philip Amadas and Arthur Barlowe, reached the coast of Virginia, taking possession in the name of the queen.		1604. Samuel de Champlain, in the interest of the French, ascended the Penobscot river, Maine.	
	1585. Raleigh's second expedition, under Sir Richard Grenville, arrived at Ocracoke inlet. He left a colony of 107 men at Roanoke Island, Virginia.		1604. George W. Weymouth, sailing from Dartmouth, explored the Kennebec.	
	1586. Sir Francis Drake, after sailing St. Augustine, came to anchor near Roanoke Island, taking back to England the earliest colony of emigrants.		1606. Sir Ferdinando Gorges dispatched an expedition under Thomas Thomas.	
	1587. Raleigh's third expedition, under Simon Ferdinando, arrived at Hatteras (Hatteras), landing 120 pounds.		1607. An English expedition for colonization left the Downs, and reached Chesapeake bay. It consisted of the <i>Sovereign</i> , Captain Christopher Newport, with seventy-one persons; <i>God-Speed</i> , Captain Bartholomew Gosnold, with fifty-two persons; <i>Discovery</i> , Captain John Rolfe, with twenty persons; crews, thirty-nine total 104 persons. May 13, landed, and settled Jamestown, Virginia. The political history of the United States begins with this event.	
	1602. Captain Bartholomew Gosnold, sailing from			

### III. COLONIAL PERIOD, 1607-1763 A. D.

BRITISH COLONIES	MONARCHS OF ENGLAND	FRENCH COLONIES	MONARCHS OF FRANCE	SPANISH COLONIES	MONARCHS OF SPAIN
1607. English settlement at Jamestown. Captain John Smith resumed by Pocahontas.	1603-1625. James I.	1606. Champlain settles Quebec.	1589-1610. Henri IV.	1610. Leon, Central America founded.	1598-1621. Philip III.
1614. New Amsterdam settled by the Dutch.		1611. French Jesuits settle at Port Royal.	1610-1643. Louis XIII.	1611. Talamancas Indians, of Central America, massacred by the Spanish.	
1618. Death of Powhatan, Indian chief.		1615. Indian missions established.		1620. Buenos Ayres separated from Tucumán.	
1619. First slaves brought to Virginia by the Dutch.		1620. Champlain governor of Canada.			1621-1664. Philip IV.
1620. Mayflower lands at Plymouth, Mass. Peregrine White, first white child born in New England.					
1621. Death of John Carver, first governor of Plymouth colony; succeeded by William Bradford.					
Mike Standish, captain.					
1622. New Hampshire settled.					
1623. Lord Baltimore founds a colony at Ferryland, Newfoundland.	1625-1649. Charles I.	1628. Port Royal taken by the English.		1630. Spaniards expel the Dutch from Brazil.	
1627. Swedes and Finns settle at Cape Henlopen.		1629. Sir David Kirke captures Quebec.		Alvarado subdues Central American Indians.	
1628. John Endicott governor of Massachusetts.		1632. Richelieu obtains restoration of territory.		Havti seized by French buccaners.	
1629. John Winthrop governor of Massachusetts.				1635-1638. French, English and Dutch make numerous settlements in the West Indies.	
1632. Lord Baltimore receives the grant of Maryland.					
1633. Connecticut settled by the English.					
Wentur Van Twiller governor of New Amsterdam.					
1634. English Catholics settle at St. Mary's, Maryland.					
1636. Roger Williams settles Rhode Island.					
Pequot war begins in Massachusetts.					
Sweden settles Delaware.					
1638. John Harvard bequeaths his library to found a college.					
New Haven settled.					
1639. Printing press established by Stephen Daye at Cambridge, Massachusetts.		1639. Ursuline convent established at Quebec.			
First constitution of Connecticut.		1640. The French attempt a settlement at Green Bay, Wisconsin.		1640. Spanish fleet of sixty vessels arrives off coast of Brazil.	
		1641. Montreal founded.			
1642. Sir William Berkeley governor of Virginia.			1643-1715. Louis XIV.		
1643. Sweden settles in Pennsylvania.					
1645. Free schools established at Roxbury, Mass.					
1647. Peter Stuyvesant governor of New Amsterdam.					
1652. Mint established in Boston, John Hull, mintmaster.	1649-1660. Commonwealth.				
1653. North Carolina settled.					
1655. Delaware brought under Dutch rule.					
1656. Quakers arrive in Boston.					
	1660-1685. Charles II.	1659. Laval-Montmorency first bishop of Quebec.		1661. Dutch give up Brazil.	
		French fur traders capture Lake Superior.		1663. Spain denies the right of England to the province of Carolina.	
				1665. St. Augustine pillaged by English buccaners.	1665-1700. Charles II.
1664. Fort Amsterdam surrendered to the English.		1668. Marquette establishes mission at Sault Ste. Marie.			
1665. Provincial government established in Maine.		1670. Maine, east of the Penobscot, occupied by the French.		1671. Danes occupy St. Thomas.	
1670. South Carolina settled.		1672. Count de Frontenac governor of Canada.			
1671. French settle in Michigan.		1673. Marquette and Joliet descend the Wisconsin to the Mississippi in canoe, continue on nearly to mouth of the Arkansas, and return.			
		Fort Frontenac (Kingston, Ontario) built.			
1673. New York and New Jersey surrendered to the Dutch.					
1675. King Philip's war in Massachusetts.					
1676. Nathaniel Bacon's rebellion in Virginia.					

## III. COLONIAL PERIOD—Continued

KING PHILIP'S WAR, 1675-1676					
WHERE IT OCCURRED	CAUSES	INDIAN TRIBES INVOLVED	EVENTS	RESULTS	
Massachusetts, Rhode Island and the frontier settlements of all New England.	The prosperity and the encroachments of the whites. The unjust treatment of the Indians.	The Wampanoags, Narragansetts, Pequots, and other tribes living in New England.	Swansey, Hadley, Deerfield and other towns were burned. The Pequots were almost exterminated in the swamp fight.	The colonies sacrificed six hundred lives and more than half a million odd dollars. The settlements were greatly weakened.	
BACON'S REBELLION, 1676					
CAUSES		EVENTS		RESULTS	
(1) The government gradually usurped the power of the people. The assembly continued to sit without change. The officers extended their terms indefinitely. Suffrage was restricted by a property qualification, and the people were heavily taxed. (2) There was dissatisfaction because the king had given Virginia to Lords Arlington and Culpeper. (3) Indian depredations.		Nathaniel Bacon, the leader, demanded a commission to fight the Indians. Berkeley refused to grant it, and Bacon, without the governor's consent, put himself at the head of a company of men, and marched against the Indians. Returning victorious, Bacon was triumphantly restored to his seat in the House of Burgesses. Here he pressed his demand for a commission until the governor yielded, and Bacon a second time went against the Indians. Bacon after he had gone, Berkeley declared Bacon and his followers rebels, and marched against them. Berkeley was defeated, and Bacon entered Jamestown. Fearing the arrival of an English fleet, he burned the town. In the midst of success Bacon died, and Berkeley regained the power.		There were fines, imprisonments, and confiscations of property; twenty-two of the rebels were hung. Charles II, disgusted with the severity of Berkeley, recalled him. The oppressions of the people were increased. Williamsburg became the capital of Virginia. After this time there was very little trouble with the Indians in Virginia.	
BRITISH COLONIES		MONARCHS OF ENGLAND	FRENCH COLONIES	MONARCHS OF FRANCE	SPANISH COLONIES
1681. William Penn receives charter for Pennsylvania. 1683. First assembly in New York under English rule.  1689-1697. <b>King William's war.</b> 1690. Colonial Congress called in New York.  1700. Williamsburg made capital of Virginia. 1701. Philadelphia incorporated as a city. 1702-1713. <b>Queen Anne's war.</b> 1704. Deerfield, Massachusetts, burned.  1719. Scotch-Irish settle in New Hampshire.   1729. British government formally recognises colony of Newfoundland. 1732. First stage between Boston and New York. 1739. Richmond, Va. founded by William Byrd.  1744-1748. <b>King George's war.</b> Hostilities with the six Indian nations. 1746. Louisburg, Cape Breton Island, N. S., captured by New England troops.  1752. Franklin experiments with electricity. 1753. First theater opened in New York. 1754. Convention at New York to consider a colonial confederacy. <b>French and Indian war.</b>		1689-1689. James II. 1689-1702. William III. Mary.  1702-1714. Anne. 1714-1727. George I.  1727-1760. George II.  1760-1820. George III.	1679. French at Niagara falls. 1682. Le Salle descends the Mississippi to its mouth and names the regions drained by the Mississippi, the Ohio, and their tributaries, "Louisiana." 1685-1687. French in Texas under La Salle. 1689. French occupy Hudson bay territory. Iroquois capture Montreal and Lachine. 1691. Acadia retaken by the French. 1702. Settlement in Alabama on Mobile river. 1710. Fort Royal captured by English fleet. 1718. New Orleans founded.  1729. Massacre of French at Natchez by Indians.  1745. Louisburg, N. S., captured by the British. 1749. Fort Rouille (Toronto) built. 1752. Marquis Duquesne, governor of Canada.  1760-1820. George III.	1715-1774. Louis XV.  1774-1793. Louis XVI.	1685. Dampier, English buccaneer, sacks Leon.  1693. Gold mining begins in Brazil.  1710. French capture Rio de Janeiro.  1719. French capture Pensacola. 1722. Pensacola restored to Spain. Treaty between Chilians and Spaniards. 1729. Spaniards establish themselves at Montevideo.  1740. General Oglethorpe attacks Florida.  1746-1759. Ferdinand VI.  1759-1788. Charles III.
FRENCH AND INDIAN WAR, 1755-1763					
CAUSES	CAMPAIGNS AND ENGAGEMENTS			RESULTS	
<i>Remote.</i> a. The conflicting claims to territory. b. The enmity between England and France. <i>Immediate.</i> c. The settlement of the Ohio valley.	1753. Washington was sent to the French fort. A fort was begun by the Ohio company at the headwaters of the Ohio river. 1754. A force was sent from Virginia to the Ohio valley. The first bloodshed was at Great Meadows. The attack on Fort Necessity. The Council at Albany. 1755. An expedition against the Acadians. An expedition against Fort Duquesne. An expedition against Fort Niagara and Frontenac. An expedition against Fort Ticonderoga. 1756. The Indians were defeated in Pennsylvania and Virginia. Fort Ontario was captured by the French. 1757. A campaign against Louisburg. Fort William Henry was captured by the French. 1758. The siege of Louisburg, Cape Breton Island. An expedition against the forts on Lake Champlain. An expedition against Fort Duquesne. Fort Frontenac was captured by the English. 1759. An expedition against Fort Ticonderoga. An expedition against Fort Niagara. The siege of Quebec. The French were defeated near Quebec. Wolfe and Montcalm killed. Montreal was surrendered to the English. The Cherokee war. 1761. Havana was captured by an English fleet. 1763. Pontiac's war.			The treaty of Paris. a. France surrendered Canada to England, except three small islands near Newfoundland, and her possessions east of the Mississippi river, except New Orleans. b. France ceded to Spain her possessions west of the Mississippi river, and New Orleans. c. Spain ceded Florida to England in return for Havana. It cost the colonists thirty thousand men and eleven million dollars. It engendered strife between the colonists and England. It created a bond of union among the colonies. It skilled the colonists in the art of war. It gave England a vast extent of territory in the new world, which, added to what she already possessed, proved too great for her control. During the war, England allowed the colonies freedom in trade. When she again attempted to enforce her obnoxious laws, the colonists resisted more persistently than before.	

## IV. PERIOD OF UNION AND INDEPENDENCE, 1763-1783 A. D.

BRITISH COLONIES	CONTINENTAL CONGRESS				SPANISH COLONIES
	CONGRESS	HELD AT	BEGAN	CONTINUED	
1765. The Stamp act passed by the English Parliament. A convention of the colonies assembled in New York, October 7, to resist the Stamp act. In November tumults occurred in Boston.	1	New York.	May, 1690		
1766. The Stamp act repealed by the House of Commons.	2	Albany.	June 19, 1754		
1767. The taxation of the colonies resumed, against addresses, petitions, and remonstrances of the people.	3	New York.	Oct. 3, 1765		
1773. Settlement of the territory afterward comprised within Kentucky, by Daniel Boone.	Stamp Act Congress				
1774. By act of Parliament, the port of Boston closed, and General Gage appointed governor of Massachusetts to see that the law was executed. September 5, twelve colonies formed themselves into a Congress.	1	Philadelphia.	Sept. 5, 1774	14 days	1766. Large colony of Acadians arrive in Louisiana.
1775. Coercive measures continued on the part of Great Britain, and the colonies awake to the determination for the Declaration of Independence, July 4, 1776.	2	Philadelphia.	May 10, 1775	562 days	1768. Revolt of the French against Spanish rule in Louisiana.
1776, June 11. Committee appointed "to prepare and properly digest a form of confederation to be entered into by the several states." Committee: John Dickinson, Chairman; Jonah Bartlett, Samuel Adams, Roger Sherman, Robert R. Livingston, Thos. McKean, Thos. Boone, Thos. Nelson Jr., Edward Rutledge, Boston Gwinnett (one delegate from each state).	3	Baltimore.	Dec. 20, 1776	75 days	1773. Santiago, Guatemala, destroyed by an earthquake.
	4	Philadelphia.	Mar. 4, 1777	199 days	
	5	Lancaster, Pa.	Sept. 27, 1777	1 day	
	6	York, Pa.	Sept. 30, 1777	272 days	
	7	Philadelphia.	July 2, 1778	1616 days	
	8	Princeton, N. J.	June 30, 1783	127 days	
	9	Annapolis, Md.	Nov. 28, 1783	169 days	
	10	Trenton, N. J.	Nov. 1, 1784	64 days	
	11	New York.	Jan. 11, 1785	298 days	
	12	New York.	Nov. 7, 1785	362 days	
	13	New York.	Nov. 6, 1786	359 days	
	14	New York.	Nov. 5, 1787	353 days	1774. Old Guatemala destroyed by volcanic eruption.

THE AMERICAN REVOLUTION, 1775-1783		
CAUSES	PRELIMINARY EVENTS	RESULTS
<i>Remote:</i> The character of the colonists. The arbitrary government of England. a. Laws passed by parliament interfering with colonial trade and industries. b. The character of the royal governors. The presence of anti-monarchical institutions. a. Free schools, free press, town meetings, etc. The results of the intercolonial wars. <i>Immediate:</i> The Stamp act. <i>Impeding:</i> The Navigation act, 1651, § 60, 63. Restrictions were passed on internal trade, 1673. The Board of Trade and Plantations was organized, 1696. Courts of admiralty were established, 1697. The exportation of hats forbidden, 1732. The importation or Molasses act, 1733. The erection of iron-works was forbidden, 1750. Writs of assistance were granted, 1761. The Stamp act, 1765. The Quartering, or Mutiny act, 1765.	The resolutions of Patrick Henry, 1765. The organization of the Sons of Liberty, 1765. The organization of the Daughters of Liberty, 1765. The first Colonial Congress, 1765. The repeal of the Stamp act, 1766. An act imposing a duty on tea, glass, paper and painter's colors was passed, 1767. Troops were sent over to Boston, 1768. The trouble between the citizens and soldiers in New York, 1770. The Boston massacre, 1770. The troops were removed to Castle William, 1770. Duties were removed, except on tea, 1770. The export duty on tea was removed, 1773. The Boston Tea-party, 1773. The Boston Port bill, 1774. The First Continental, (or the second Colonial) Congress 1774. The minute men were organized, 1774. Boston Neck was fortified. The colonial stores were removed to Concord, 1774.	1. The treaty of Versailles, or Paris. a. Great Britain acknowledged the independence of the United States. b. The boundaries of the United States: north and east as at present; south, Florida: west, the Mississippi river. c. Free navigation of the Mississippi river and the Great Lakes was granted to the United States. d. The United States was given an interest in the fisheries. e. England retained Canada and the control of the St. Lawrence river. f. England granted Florida to Spain. 2. Cost. a. England: men, 50,000; money, about \$610,000,000. b. United States: men, 40,000; money, about \$135,000,000.

PRINCIPAL CAMPAIGNS AND BATTLES		
The leading battles are indicated in bold-face; successful commanders in italics.		
DATE	NAMES AND PLACES OF BATTLES	COMMANDERS
		American British
		Engaged Killed Engaged Killed
1775-1776.	<b>Campaign in New England, Lexington, Concord</b>	
April 19, 1775		Barret and Buttrick. .... 50 1700 65
May 10, 1775	Ticonderoga.	Ethan Allen and Eaton. .... 48 ....
June 17, 1775	<b>Bunker Hill.</b>	Warren, Prescott and Putnam. .... 3000 450 1050 1050
Dec. 6-31, 1775	Quebec.	Schuyler, M'Lean and Carleton. .... 900 160 1200 20
Dec. 8, 1775	Norfolk, Va.	Woodford. .... 62
Mar. 17, 1776	Boston.	The British evacuated the city and Clinton. .... harbor. 400 10 4000 225
June 28, 1776	Charleston (Pa. Moultrie).	<i>Moultrie, Lee and Armstrong.</i>
1776-1778.	<b>Campaign in Middle States.</b>	
Aug. 26, 1776	Brooklyn, L. I.	Greene and Sullivan. .... 10000 2000 30000 400
Sept. 16, 1776	Harlem Plains, N. Y.	Washington. .... 18
Oct. 28, 1776	<b>White Plains, N. Y.</b>	Howe. .... 300 2000 300
Nov. 15, 1776	Fort Mifflin, N. Y.	Howe. .... 300 100 3000 1000
Dec. 26, 1776	Fort Mifflin, N. Y.	Howe. .... 2 1000 36
Jan. 3, 1777	<b>Princeton, N. J.</b>	Washington. .... 3000 100 1800 30
July 7, 1777	Hubbardston, Vt.	Lord Cornwallis and Rahl. .... 700 324 1200 183
Aug. 6, 1777	Fort Mifflin, N. Y.	Warner, Francis and Hale. .... 2000 150 .... unkn.
		<i>Herbert and Ganssamer.</i>

1776. Large colony of Acadians arrive in Louisiana.

1768. Revolt of the French against Spanish rule in Louisiana.

1773. Santiago, Guatemala, destroyed by an earthquake.

1774. Old Guatemala destroyed by volcanic eruption.

1775. Bermuda ships gunpowder to assist American.

1776. Paraguay placed under the jurisdiction of Buenos Ayres.

Buenos Ayres made capital of the viceroyalty.

## IV. PERIOD OF UNION AND INDEPENDENCE—Continued

## PRINCIPAL CAMPAIGNS AND BATTLES OF THE AMERICAN REVOLUTION—Continued

DATE	NAMES AND PLACES OF BATTLES	COMMANDERS		AMERICAN		BRITISH		RESULTS	FRENCH AND SPANISH COLONIES
		American	British	Engaged	Killed	Engaged	Killed		
Aug. 15, 1677	<b>Brennenton, Va.</b>	<i>Stark</i>	<i>Baum</i>	.....	200	1200	200		
Sept. 11, 1777	<b>Brandywine, Pa.</b>	<i>Warner</i>	<i>Beyman</i>	11000	300	18000	800		
Sept. 19, 1777	<b>Bemis Heights, N. Y.</b>	<i>Gates</i>	<i>Howe</i>	2500	.....	3000	.....		
Oct. 4, 1777	<b>Germanstown, Pa.</b>	<i>Washington</i>	<i>Burgoyne</i>	11000	152	15000	1000		
Oct. 4-6, 1777	<b>Montgomery, N. Y.</b>	<i>James Clinton</i>	<i>Sir H. Clinton</i>	800	.....	3000	.....		
Oct. 7, 1777	<b>Stillwater (Saratoga).</b>	<i>Gates</i>	<i>Burgoyne</i>	6000	.....	6000	.....	Surrender of the British under Burgoyne.	
Oct. 22, 1777	<b>Fort Mifflin, Pa.</b>	<i>Greene</i>	<i>Howe</i>	450	.....	2000	.....		
Oct. 22, 1777	<b>Red Bank, N. J.</b>	<i>Greene</i>	<i>Sir William Howe</i>	.....	8	.....	400		
Nov. 16, 1777	<b>Fort Mifflin, Pa.</b>	<i>Thayer</i>	<i>Howe</i>	400	.....	.....	.....		
Nov. 28, 1778	<b>Monmouth, N. J.</b>	<i>Washington</i>	<i>Sir Henry Clinton</i>	10000	67	11000	300	British make headquarters at New York.	1778. <i>Frederick</i> Haldimand governor of Canada.
July 2, 1778	<b>Schoharie, N. Y.</b>	<i>Brown</i>	<i>Indiana</i>	.....	14	.....	.....		
July 2, 1778	<b>Wyoming, Pa.</b>	<i>Z. Butler</i>	<i>John Butler</i>	400	.....	1000	222		
Aug. 29, 1778	<b>Quaker Hill, R. I.</b>	<i>Swinton</i>	<i>Pigot</i>	900	20	800	20		
Dec. 17-18, 1778	<b>Campaign in the South.</b>								
Dec. 20, 1778	<b>Savannah, Ga.</b>	<i>Robert Howe</i>	<i>Campbell</i>	500	100	2000	.....	Charleston in control of British.	
Jan. 9, 1779	<b>Fort Stanbury, Ga.</b>	<i>Laspeyres</i>	<i>Laspeyres</i>	200	.....	2000	.....		
Mar. 3, 1779	<b>Brier Creek, Ga.</b>	<i>Ashe</i>	<i>Prentiss</i>	1200	150	1800	100		
June 20, 1779	<b>Stony Ferry, S. C.</b>	<i>Lincoln</i>	<i>Maitland</i>	800	146	2000	63		
July 16, 1779	<b>Stony Point, N. Y.</b>	<i>Wayne</i>	<i>Clinton</i>	900	16	.....	.....		
Aug. 13, 1779	<b>Penobscot, Me.</b>	<i>Lovell</i>	<i>McLean</i>	400	.....	3000	150		
Aug. 29, 1779	<b>Chemung, N. Y.</b>	<i>Sullivan</i>	<i>Brant</i>	900	.....	1500	.....	Alliance of the Six Nations severed.	
Oct. 9, 1779	<b>Fort Mifflin, Pa.</b>	<i>Sullivan</i>	<i>Clinton</i>	4000	.....	2000	.....		
May 12, 1780	<b>Charleston, S. C.</b>	<i>Lincoln</i>	<i>Clinton</i>	3700	.....	9000	5	British gain control of South.	
May 29, 1780	<b>Waxhaw, S. C.</b>	<i>Abel Buford</i>	<i>Tarleton</i>	400	113	.....	35		
June 23, 1780	<b>Cornfield, N. C.</b>	<i>Clinton</i>	<i>Knyphausen</i>	3000	18	.....	.....		
July 30, 1780	<b>Rocky Mount, S. C.</b>	<i>Sumter</i>	<i>Turnbull</i>	600	.....	500	.....		
Aug. 7, 1780	<b>Hanging Rock, S. C.</b>	<i>Sumter</i>	<i>Brown</i>	600	12	500	.....		
Aug. 18, 1780	<b>Canebar, S. C. (Savannah Creek)</b>	<i>Sumter</i>	<i>Cornwallis</i>	700	.....	3500	180		
Aug. 18, 1780	<b>Fishing Creek, S. C.</b>	<i>Sumter</i>	<i>Tarleton</i>	700	.....	3500	180		
Oct. 7, 1780	<b>King's Mountain, S. C.</b>	<i>Campbell</i>	<i>Ferguson</i>	900	20	1100	.....		
Nov. 12, 1780	<b>Fishdam Ford, S. C.</b>	<i>Sumter</i>	<i>Wemyss</i>	500	.....	450	.....		
Nov. 20, 1780	<b>Black Stock, S. C.</b>	<i>Sumter</i>	<i>Tarleton</i>	500	.....	400	800		
Jan. 17, 1781	<b>Cowpens, S. C.</b>	<i>Morgan</i>	<i>Cornwallis and Tarleton</i>	900	70	1100	.....	Retreat of British.	
Feb. 25, 1781	<b>Battle of the Haw.</b>	<i>Lee</i>	<i>Pryor</i>	.....	none	.....	600		
Mar. 15, 1781	<b>Guilford, C. H., N. C.</b>	<i>Greene</i>	<i>Cornwallis</i>	4400	1300	2400	258		
April 25, 1781	<b>Hobbs's Hill, S. C.</b>	<i>Greene</i>	<i>Rauden</i>	1200	266	900	.....		
May-June 1781	<b>Fort 90, N. C.</b>	<i>Greene</i>	<i>Cruger</i>	1000	150	550	.....		
June 1-4, 1781	<b>Augusta, Ga.</b>	<i>Evolution</i>	<i>Brown</i>	.....	.....	52	.....		
Sept. 6, 1781	<b>New London, Conn., Fort Griswold</b>	<i>Ledyard</i>	<i>Benedict Arnold</i>	150	16	800	187		
Sept. 8, 1781	<b>Entaw Springs, S. C.</b>	<i>Greene</i>	<i>Lord Rawdon</i>	2000	152	2800	693	Control of South passes to colonists.	
Oct. 16-19, 1781	<b>Yorktown, Va.</b>	<i>Washington</i>	<i>Cornwallis</i>	16000	300	7500	7500	Cornwallis surrenders. See results above.	

NOTE.—The most daring naval exploit during the war was fought off the coast of Scotland, September 23, 1779, between the *Ben Home* Richard, of forty guns, Paul Jones, commander, and the *Serapis*, a British frigate of forty-four guns, Captain Pearson. The *Serapis* surrendered, with a loss of 100. Jones lost 300 in killed and wounded, and while his ship was sinking transferred his crew to the *Serapis*.

1781, March 2. Congress assembled under the new powers of the Articles of Confederation.  
 1782. Holland recognizes the independence of the United States. British the evacuate Charleston. French army embark from Boston.  
 1783. Denmark, Sweden, Spain and Russia recognize the independence of the United States. Treaty of peace signed with Great Britain. Eight Continental Congress meets at Princeton, N. J.

## V. PERIOD OF CONFEDERATION AND CONSTITUTION, 1783-1788 A. D.

POLITICAL EVENTS	SIGNERS OF THE CONSTITUTION								CANADA	LATIN AMERICA
	NAME	REF.	BIRTHPLACE	DATE/AGE	OCCUPATION	DIED				
1784. Congress adopts decimal currency system.	Baldwin, Abraham	Ga.	N. Guilford, Conn.	1784	33	Lawyer.	1807		1784. N. E. Loyalists settle in Upper Canada.	1784. Island of St. Bartholomew transferred to Sweden.
1785. Continental Congress meets at Trenton, N. J.	Basnett, Richard.	Del.	Delaware.	.....	.....	Lawyer.	1815			
1785. John Adams ambassador to London.	Bedford, Gunning, Jr.	Del.	Philadelphia, Pa.	1747	40	Lawyer.	1812			
1785. Thomas Jefferson appointed minister to France.	Blair, Joseph.	Va.	Williamsburg, Va.	1732	55	Lawyer.	1800			
1786. Daniel Shay's rebellion in Massachusetts.	Blount, Wm.	N. C.	C. Craven Co., N. C.	1744	43	Politician.	1800			
United States mint authorized.	Brewster, David.	N. J.	Trenton, N. J.	1741	44	Lawyer.	1790			
1787. Constitutional convention assemblies at Philadelphia.	Broom, Jacob.	Del.	.....	1752	35	Lawyer.	1810			
1787. Washington, John Adams, Hamilton, Madison, Morris, Franklin and Handolph.	Butler, Pierce.	S. C.	Ireland.	1744	43	Army.	1822			
1787. The government under the Articles of Confederation was weak in that it had no coercive power.	Canal, Daniel.	Pa.	Philadelphia, Pa.	1739	48	Merchant.	1813			
1787. The signing of the Constitution.	Clymer, Geo.	N. J.	Elizabethtown, N. J.	1760	27	Army.	1824			
1787. The signing of the Constitution.	Dayton, Jonathan.	Pa.	.....	1753	34	Lawyer.	1808			
1787. The signing of the Constitution.	Dickinson, John.	Pa.	Baltimore Co., Md.	1748	39	Lawyer.	1828			
1787. The signing of the Constitution.	Few, Wm.	Pa.	.....	1741	46	.....	1811			
1787. The signing of the Constitution.	Fitzsimons, Thos.	Pa.	.....	1708	61	Printer.	1790			
1787. The signing of the Constitution.	Franklin, Benj.	N. H.	.....	1753	32	Politician.	1794			
1787. The signing of the Constitution.	Gilman, Nicholas.	Mass.	Charlestown, Mass.	1738	49	Lawyer.	1796			
1787. The signing of the Constitution.	Gorham, Nathaniel.	Pa.	.....	1757	30	Lawyer.	1816			
1787. The signing of the Constitution.	Hamilton, Alexander.	Pa.	New Haven, Conn.	1750	37	Lawyer.	1822			
1787. The signing of the Constitution.	Ingersoll, Jared.	Pa.	.....	1733	54	Army.	1790			
1787. The signing of the Constitution.	Jeffer, Daniel, of St.	Md.	.....	1727	50	Lawyer.	1819			
1787. The signing of the Constitution.	Johnson, Wm. Sam'l	Mass.	Nearborough, Me.	1755	32	Lawyer.	1827			
1787. The signing of the Constitution.	King, Rufus.	N. H.	Portsmouth, N. H.	1741	43	Lawyer.	1819			
1787. The signing of the Constitution.	Livingstone, Wm.	N. J.	Albany, N. Y.	1723	64	Lawyer.	1790			
1787. The signing of the Constitution.	Madison, James, Jr.	Va.	Port Conway, Va.	1751	36	Lawyer.	1836			
1787. The signing of the Constitution.	McHenry, John.	Md.	.....	1753	33	Politician.	1800			
1787. The signing of the Constitution.	Mifflin, Thos.	Pa.	Philadelphia, Pa.	1744	43	Politician.	1800			
1787. The signing of the Constitution.	Morris, Gouverneur.	Pa.	Morrisania, N. Y.	1752	35	Lawyer.	1816			
1787. The signing of the Constitution.	Morris, Robt.	Pa.	.....	1753	34	Banker.	1806			
1787. The signing of the Constitution.	Paterson, Wm.	N. J.	N. J. or at sea.	1754	33	Lawyer.	1806			
1787. The signing of the Constitution.	Pockney, Charles.	S. C.	Charleston, S. C.	1758	29	Lawyer.	1824			
1787. The signing of the Constitution.	Rockney, C. C.	S. C.	Charleston, S. C.	1741	43	Lawyer.	1825			
1787. The signing of the Constitution.	Read, Geo.	Del.	Cecil Co., Md.	1733	54	Lawyer.	1798			
1787. The signing of the Constitution.	Rutledge, John.	S. C.	Charleston, S. C.	1739	48	Lawyer.	1800			
1787. The signing of the Constitution.	Sherman, Roger.	Conn.	Newtown, Mass.	1721	66	Lawyer.	1793			
1787. The signing of the Constitution.	Swayth, Rich'd Dobbs	N. C.	Newbern, N. C.	1758	29	Lawyer.	1802			
1787. The signing of the Constitution.	Washington, Geo.	Va.	Westmoreland Co., Va.	1732	55	Army.	1799			
1787. The signing of the Constitution.	Williamson, Hugh.	N. C.	Chester Co., Pa.	1753	32	Physician.	1799			
1787. The signing of the Constitution.	Wilson, Jas.	Pa.	St. Andrews, Scot.	1742	45	Lawyer.	1798			

## VI. FROM THE ADOPTION OF THE CONSTITUTION TO THE CIVIL WAR, 1789-1861 A. D.

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1789. <b>George Washington</b> , President; John Adams, Vice-President. First Congress meets in New York. First tariff bill passed. Cabinet departments and United States Supreme Court organized.	Thomas Jefferson, <i>Sec. State</i> . Alexander Hamilton, <i>Sec. Treas.</i> Henry Knox, <i>Sec. War</i> . R. Ogden, T. Pickering, <i>Post Gen.</i> Edmund Randolph, <i>Atty. Gen.</i>			1789. Settlers from North Carolina arrive in Louisiana. Malapina explores the coast of South America.
1793. Indian war in Northwest Territory. Death of Benjamin Franklin. Census enumeration ordered.			1791. Canada divided into upper and lower.	1791. Negroes of Hayti revolt against France.
1791. Anthracite coal discovered in Pennsylvania. Vermont admitted as a state.			1793. Toronto founded. Slavery abolished in upper Canada.	
1792. Corner stone of White House laid. Kentucky admitted. Whitney invents the cotton-gin.	Thomas Jefferson, E. Randolph, T. Pickering, <i>Sec. State</i> . Alexander Hamilton, O. Wolcott, <i>Sec. Treas.</i> Henry Knox, T. Pickering, J. McHenry, <i>Sec. War</i> . T. Pickering, J. Habersham, <i>Post Gen.</i> E. Randolph, W. Bradford, C. Lee, <i>Atty. Gen.</i>	1795. Jacob Perkins, of Newburyport, Mass., patented a machine for cutting and leading sails. Etienne Bore developed method for extracting sugar from the cane.	1794. Jay's treaty relative to commerce, navigation, and boundary.	1795. Maroon war in Brazil. Sugar first produced from cane in Louisiana.
1793. Washington reflected; John Adams, Vice-President. Corner stone of United States Capitol laid by Washington. Political parties assume names of Republicans and Federalists. Third Congress opens at Philadelphia.		1796. John Fitch ran the first screw boat using steam power on the Culpeper, New York. Biny and Ronaldson establish in Philadelphia the first permanent type-foundry. New York Insurance company incorporated. The first glass works in Pittsburgh.	1797. Sault Ste. Marie canal begun.	1796. Maroon war in Brazil. Sugar first produced from cane in Louisiana.
1794. Foundation of United States navy authorized. Whisky insurrection, Pennsylvania. 1795. Anti-ent troubles, New York.		1796. John Fitch ran the first screw boat using steam power on the Culpeper, New York. Biny and Ronaldson establish in Philadelphia the first permanent type-foundry. New York Insurance company incorporated. The first glass works in Pittsburgh.		1796. Maroon war in Brazil. Sugar first produced from cane in Louisiana.
1796. Tennessee admitted. Washington issues his farewell address.		1797. French directory issued decree against American commerce.		1796. Maroon war in Brazil. Sugar first produced from cane in Louisiana.
1797. John Adams, President; Thomas Jefferson, Vice-President. Special session of Congress to consider relations with France.	Timothy Pickering, John Marshall, <i>Sec. State</i> . Oliver Wolcott, Samuel Dexter, <i>Sec. Treas.</i> James McHenry, Samuel Dexter, <i>Sec. War</i> . Benjamin Stoddert, <i>Sec. Navy</i> . J. Habersham, <i>Post Gen.</i> Chas. Lee, <i>Atty. Gen.</i>	1798. First salt manufactory established in Ohio. Comb making machine patented. Merino sheep brought from Spain.		1796. Maroon war in Brazil. Sugar first produced from cane in Louisiana.
1798. Alien and sedition laws passed.		1799. Eliakim Spooner took out first patent for a seeding machine.		1796. Maroon war in Brazil. Sugar first produced from cane in Louisiana.
1799. General post-office established. Death of George Washington.		1800. United States first imported India rubber at Boston.	1800. The Sault Ste. Marie canal in Canada completed.	1800. Louisiana transferred to France by Spain.
1800. French spoliation claims adjusted. Capital removed from Philadelphia to Washington.	James Madison, <i>Sec. State</i> . Samuel Dexter, Albert Gallatin, <i>Sec. Treas.</i> Henry Dearborn, <i>Sec. War</i> . Benj. Stoddert, Robert Smith, <i>Sec. Navy</i> . J. Habersham, G. Granger, <i>Post Gen.</i> Levi Lincoln, <i>Atty. Gen.</i>	1801. First sheet-copper turned out from Pease River's mill at Canton, Mass.		1801. Toussaint l'Ouverture founds republic in St. Domingo.
1801. Thomas Jefferson, President. Aaron Burr, Vice-President. Congress establishes the District of Columbia. Tripoli declares war against the United States.		1802. Process for making potato starch patented by John Biddle, of Philadelphia. First important powder works established by Eleuthère 1. du Pont. Philadelphia chamber of commerce established.		1802. The Dutch resume possession of British Guiana.
1803. Louisiana purchased for \$15,000,000. Ohio admitted.		1803. First cotton mill established in New Hampshire.	1803. Slavery illegal in lower Canada.	1803. French quit Hayti. British Guiana finally acquired.
1804. Vice-President Burr kills Hamilton in a duel.		1804. The manufacture of white lead begun by Samuel Wetherill in Philadelphia.		1803. French quit Hayti. British Guiana finally acquired.
1805. Jefferson reflected; George Clinton, Vice-President.	James Madison, <i>Sec. State</i> . Henry Dearborn, William Eustis, <i>Sec. War</i> . Robert Smith, J. Crowninshield, <i>Sec. Navy</i> . O. Granger, <i>Post Gen.</i> Levi Lincoln, R. Smith, J. Breckinridge, C. A. Rodney, <i>Atty. Gen.</i>	1805. Robert Fulton originated the marine torpedo. Frasers ink first manufactured here.		1807. Slave trade abolished in Dutch Guiana.
1807. Embargo act passed. Fulton's steamboat, Clermont, steams from New York to Albany.		1806. David Melville, of Newport, R. I., made earliest use of gas to light his house. First American saw-manufactured by William Howland of Philadelphia.		1807. Slave trade abolished in Dutch Guiana.
1807. Embargo act passed. Fulton's steamboat, Clermont, steams from New York to Albany.		1807. Fulton's first steamboat, the Clermont, made the trip from New York to Albany. Eli Terry, of Plymouth, Conn., began the manufacture of clocks by machinery.		1807. Slave trade abolished in Dutch Guiana.
1808. American Fur Co. founded by John Jacob Astor. First quinquars made by Columbia Pottery company at Philadelphia.	Robert Smith, James Monroe, <i>Sec. State</i> . Albert Gallatin, <i>Sec. Treas.</i> William Eustis, <i>Sec. War</i> . Paul Hamilton, <i>Sec. Navy</i> . G. Granger, <i>Post Gen.</i> Cesar Rodney, <i>Atty. Gen.</i>	1809. Cotton duck for sailcloth first made in the United States. Abel Stowell, of Worcester, Mass., patented a machine for cutting screw.	1809. Steamer Accommodation arrived at Quebec from Montreal.	1809. Ecuador attempts to throw off the Spanish yoke.
1809. James Madison, President; George Clinton, Vice-President. Embargo act repealed.		1810. Peregrine Williamson of Baltimore made the first metallic pens.		1810. Independence of Argentina Republic begins.
1811. Trading posts first established among the Indians. Battle of Tippecanoe, with Indians.		1811. The first steamboat left Pittsburgh for New Orleans via the Ohio and Mississippi rivers. Wooden shoe plant invented.		1810. Independence of Argentina Republic begins.
1812. Louisiana admitted. War declared against Great Britain.		1812. The first pin factory was established in New York. Pittsburgh started the first rolling-mill.	1812. Sir George Prevost governor.	1812. Spanish constitution promulgated in Costa Rica.



## VI. FROM THE ADOPTION OF THE CONSTITUTION TO THE CIVIL WAR—Continued

THE WAR OF 1812, 1812-1815							
PLACE OF BATTLE	DATE	COMMANDERS		AMER. NO. ENG.	ENG. NO. ENG.	AMER. CASUALTIES	ENG. CASUALTIES
		American	English				
Bladenburg.	Aug. 24, 1814	Winder.	Ross.	3,500	5,000	Sur.	.....
Chrysler's Field.	Nov. 11, 1813	Boyd.	Morrison.	1,500	2,000	200	.....
Chippewa.	Aug. 15, 1814	Brown.	Riall.	1,900	2,100	68	.....
Detroit.	Aug. 15, 1812	Hull.	Brook.	2,500	13,000	Sur.	.....
Frenchtown.	Jan. 22, 1813	Winchester.	Proctor.	800	1,500	200	.....
Fort Meigs.	May 5, 1813	Day.	Proctor.	1,200	2,000	73	.....
Fort George, Canada.	May 27, 1813	Dearborn.	Vincott.	2,500	3,000	84	.....
Fort Erie (assault).	Aug. 15, 1814	Gaines.	Drummond.	2,500	3,000	300	.....
Fort M'Henry, Baltimore.	Sept. 12, 1814	Armistead.	Drummond.	4,000	2,000	150	.....
Fort Erie (sortie).	Sept. 1814	Wilkinson.	Hancock.	2,500	3,000	.....	.....
La Celle Mill.	July 23, 1814	Jackson.	Keane.	3,000	2,500	240	.....
Lundy's Lane.	Aug. 9, 1812	Jackson.	Pakenham.	3,000	12,000	.....	.....
Marquette.	Dec. 23, 1814	Jackson.	Prevost.	3,000	12,000	.....	.....
New Orleans.	Jan. 8, 1815	Jackson.	Prevost.	1,200	2,500	99	.....
Plattsburg.	Sept. 1, 1814	Rennels.	Brook.	1,200	2,500	100	.....
Queenstown.	Oct. 13, 1812	Harrison.	Proctor.	2,500	20,000	80	.....
Rockett's Harbor.	May 1810	Harrison.	Burned by Ross.	1,700	1,500	300	.....
Thames, Canada.	April 27, 1813	Harrison.	Schuyler.	1,700	1,500	300	.....
Washington.	April 27, 1813	Harrison.	Schuyler.	1,700	1,500	300	.....
York, Toronto.	April 27, 1813	Harrison.	Schuyler.	1,700	1,500	300	.....

NOTE.—The British sent 134,000 troops to this war, to which among 20,000 Hessians and 10,000 Indians were added, making a total of about 164,000 in the British service engaged against the Americans. This force the Continentals met with a hastily organized army, poorly equipped, numbering about 230,000, which was supplemented by a militia of 50,000, and a flotilla of battleships furnished by France.

## NAVAL BATTLES, WAR OF 1812

DATES	WHERE FOUGHT	AMERICAN VESSELS AND COMMANDERS	BRITISH VESSELS AND COMMANDERS
August 13, 1812	Off Newfoundland.	Frigate <i>Essex</i> , Porter.*	Sloop <i>Alert</i> , Laughton.
August 19, 1812	Off Massachusetts.	Frigate <i>Constitution</i> , Hull.*	Frigate <i>Guerrick</i> , Dacres.
October 15, 1812	Off North Carolina.	Sloop <i>Wasp</i> , Jones.*	Frigate <i>Proter</i> , Whynates.*
October 25, 1812	Near Canary Islands.	Frigate <i>United States</i> , Decatur.*	Frigate <i>Macedonia</i> , Carden.
December 29, 1812	Off San Salvador.	Frigate <i>Constitution</i> , Bachebridge.*	Frigate <i>Java</i> , Lambert.
February 23, 1813	Off Demerara.	Sloop <i>Hornet</i> , Lawrence.*	Brig <i>Peacock</i> , Poole.
June 1, 1813	Massachusetts Bay.	Frigate <i>Chesapeake</i> , Lawrence.	Frigate <i>Shannon</i> , Broke.*
August 14, 1813	Off San Salvador.	Brigantine <i>Argus</i> , Allen.	Sloop <i>Pelican</i> , Maples.*
September 5, 1813	Off coast of Maine.	Brigantine <i>Enterprise</i> , Burrows.*	Brig <i>Racer</i> , Blythe.
September 10, 1813	Lake Erie.	9 vessels, 54 guns, Perry.*	6 vessels, 63 guns, Barclay.
October 8, 1813	Lake Ontario.	Commodore Chaney	captures British flotilla.
March 26, 1814	Harbor of Valparaiso.	Frigate <i>Essex</i> , Porter.	Brig <i>Plato</i> , Hill.*
April 20, 1814	Off coast of Florida.	Sloop <i>Proter</i> .	Sloop <i>Cherub</i> , Tucker.
April 29, 1814	Near British channel.	Sloop <i>Peacock</i> , Warrington.*	Brigantine <i>Orpheus</i> .
June 28, 1814	Romington, Conn.	Sloop <i>Wasp</i> , Blakely.*	Brig <i>Exeter</i> , Wales.
September 1, 1814	Near Africa.	Sloop <i>Wasp</i> , Blakely.*	Sloop <i>Reindeer</i> , Manners.
September 11, 1814	Lake Champlain.	14 vessels, 96 guns, McDonough.*	Sloop <i>Assen</i> , Arbuthnot.
September 15, 1814	Lake Champlain.	First <i>Boyer</i> , Major Lawrence.*	Sloop <i>Assen</i> , Arbuthnot.
December 9, 1814	Lake Borgue.	66 gunboats, Jones.	17 vessels, 95 guns, Downie.
January 15, 1815	Off New Jersey.	Frigate <i>President</i> , Decatur.*	4 ships, 80 guns, Col. Nichols.
February 20, 1815	Off island of Madeira.	Frigate <i>Constitution</i> , Stewart.*	40 barges, Lockyer.*
March 23, 1815	Off Brazil.	Sloop <i>Hornet</i> , Biddle.*	Squadron, Hayes.*

\*Indicates the victorious party.

†Afterward captured, with her prize, by the *Pontchar*, a British frigate of seventy-four guns.

The British vessels captured during the war of 1812 were 1,750, the American 1,683.

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA
1815. Treaty of peace with Great Britain ratified. Algerian war.		1815. Secretary of the Treasury Dallas proposed a protective tariff. The first steamboat ascended the Mississippi to Louisville.	1815. Brazil becomes a kingdom.
1816. U. S. bank chartered by Congress. Indiana admitted. A marriage colonization society formed; founds Liberia.	John Quincy Adams, Sec. State. John C. Calhoun, Sec. War. R. J. Meigs, Post Gen. William Wirt, Atty. Gen. Wm. H. Crawford, Sec. Treas. B. W. Crowninshield, S. Thompson, Sec. Navy.	1816. First savings-bank opened in America, at Philadelphia. Black-Ball packets, the first line, established between New York and Liverpool. The <i>Oswego</i> , first steamboat on Great Lakes.	1816. Argentina declares its separation from Spain.
1817. James Monroe, President; Daniel D. Tompkins, V-President. Mississippi admitted. Seminole war.		1817. Ground broken in construction of Erie canal. Thomas Gilglio & Company operated the first cylinder machine for making paper at Wilmington, Del. First instruction of deaf mutes in America by T. H. Gallaudet, at Hartford, Conn.	1817. Ottawa founded. First bank note issued at Montreal.
1818. Illinois admitted. Pensions granted Revolutionary soldiers. Alabama admitted. Florida purchased by the United States. Maine separated from Massachusetts.		1818. First line of steam packets on Long Island sound between New York and New Haven. 1819. Steamship <i>Saratoga</i> made first transatlantic trip to Liverpool. W. T. G. Morton discovers the use of ether as an anesthetic. First savings bank opened in New York. Flow with interchangeable parts patented by Jethro Wood.	1818. Earl of Dalhousie, governor.
1820. Maine admitted.		1820. First rubber shoes imported from South America. Daily meeting with regular call of stocks begun on "Change."	
1821. Monroe reflected; Daniel D. Tompkins, Vice-President. Missouri Compromise bill passed. Missouri admitted. Liberia purchased. Andrew Jackson appointed governor of Florida.	John Quincy Adams, Sec. State. Wm. H. Crawford, Sec. Treas. William Wirt, Atty. Gen. R. J. Meigs, J. McLean, Post Gen. John C. Calhoun, Sec. War. S. Thompson, J. E. Rogers, S. L. Southard, Sec. Navy.	1821. Sophia Woodhouse of Wetherfield, Conn., patented the straw hat. Breace patent patented by George J. Newbury.	1821. Mexico becomes independent of Spain. Costa Rica independent.

## VI. FROM THE ADOPTION OF THE CONSTITUTION TO THE CIVIL WAR—Continued

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1822. Independence of Spanish South American states recognized.		1822. Gadlight introduced into Boston. First patent of artificial teeth secured by C. M. Graham. The first wheel mill for manufacturing powder erected on Brandywine Creek, Del.		1822. Mexico an empire under Iturbide. Costa Rica united to Mexico. Brazil declares its independence. Pedro I. emperor. Ecuador independent. 1823. Federal republic proclaimed for Mexico. Federation of Central American states. 1824. Bolivar dictator of Peru.
1823. President Monroe proclaims the "Monroe Doctrine."		1823. Champlain canal, connecting Hudson at Albany with Lake Champlain, opened. First corporation for the manufacture of gas started at New York.		1825. Argentine constitution decreed. Upper Peru independent, takes the name of Bolivia. Republic of Central America.
1824. Gen. Lafayette arrives in New York.	Henry Clay, Sec. State. James Barbour, P. B. Porter, Sec. War. Samuel L. Southard, Sec. Navy. Richard Rush, Sec. Treas. William Wirt, Atty. Gen. J. McLean, Post. Gen.	1824. Zadoc Pratt established a great hemlock tanning factory in Green county, New York. Glazed-ground wall-papers were first made. 1825. Erie canal finished. Isaac Babbit of Taunton, Mass., invented babbit metal. The circular saw brought out by Mr. Richardson of Philadelphia.		1826. Gen. Sucre president of Bolivia; succeeded by Bolivar. War between Buenos Ayres and Brazil.
1825. John Quincy Adams, President; John C. Calhoun, Vice-President. Treaty with Russia ratified.		1826. First railroad with metal rails from Quincy, Mass., to tide water, three miles away. Power-loom for weaving wire invented by John S. Gastin, of New York. 1827. First railroad in United States built in Massachusetts. 1828. The first wool sale was held at Boston and brought \$200,000. William Woodworth invented the first machine for planing, cutting, tanguing and grooving boards. Sea island cotton first appeared in the market.	1829. Welland canal, from Port Dalhousie to Port Robinson, completed.	1829. Venezuela separates from New Granada.
1828. Protective tariff bill passed.		1829. The manufacture of sewing silk by machinery begun by James Constant Mansfield, Mated. Dr. John M. Haver of New York perfected the process of galvanizing iron. Manufacture of damask table linen begun. 1830. The first American locomotive constructed by Peter Cooper for the Baltimore and Ohio railroad.  First locomotive constructed in the United States for actual service, the <i>Best Friend</i> , built at West Point Foundry works.  Chloroform discovered by Samuel Guthrie. The Baldwin Locomotive works established in Philadelphia.		1830. Death of Bolivar. General Flores first president of Ecuador.  1831. Revolution in Brazil. Abolition of Don Pedro.
1829. Andrew Jackson, President; John C. Calhoun, Vice-President. Sweeping changes in the civil service.	Martin Van Buren, Edward Livingston, Sec. State. John H. Eaton, Lewis Cass, Sec. War. John McPherson Berrien, Roger B. Taney, Atty. Gen. Samuel D. Ingham, Louis McLane, Sec. Treas. John Branch, Levi Woodbury, Sec. Navy. William T. Barry, Post. Gen.	1830. First street railway in the country opened in New York between City Hall and Fourteenth street. First hops packed in Chicago by George Dale.	1832. Newfoundland obtains a colonial legislature.	1832. Patagonia visited by Charles Darwin, the scientist.
1830. Great speeches of Webster and Hayne delivered in the U. S. Senate.		1833. Obed Hussey patented and exhibited in Ohio the first practical reaping machine. Rose Wmams built the first typical American passenger cars.	1833. Constitutional government in Newfoundland.	1833. Santa Anna president of Mexico. Chilian constitution formed.
1832. First Democratic national convention. Black Hawk war. Nullification in South Carolina. United States bank bill vetoed by the president.	Edward Livingston, Louis McLane, John Forsyth, Sec. State. B. F. Butler, Sec. War. Lewis Cass, B. F. Butler, Sec. War. Levi Woodbury, M. Dickerson, Sec. Navy. Roger B. Taney, B. F. Butler, Atty. Gen. Louis McLane, Wm. J. Duane, Roger B. Taney, L. Woodbury, Sec. Treas. William T. Barry, Amos Kendall, Post. Gen.	1834. Cyrus Hall McCormick patented his reaper. First attempt at crushing the oil from cotton-seed made at Natchez. 1835. Chicago opened her first bank and organized a fire department. Samuel Colt began the manufacture of the revolving pistol.		1835. Texas declares her independence.
1833. Jackson re-elected; Martin Van Buren, Vice-President.  Bank deposits removed from the National Bank.		1836. First patent of friction match granted. First American patent issued for a typewriting machine.	1836. First railway in Canada opened.	1836. First Congress meets in Costa Rica.
1834. National debt extinguished. Whig party first takes its name.		1837. Captain John Ericsson successfully applied the screw propeller to steam vessels. Great commercial peace. Morse system of telegraphy invented.	1837. Papineau and Mackenzie rebellion.	1838. Buenos Ayres blockaded by French fleet. Mexico declares war against France. Slavery abolished in British West Indies.
1835. Attempted assassination of President Jackson. Seminoles war begins.	John Forsyth, Sec. State. Joel R. Polizette, B. F. Butler, Sec. War. Felix Grundy, Henry D. Gilpin, Atty. Gen. Levi Woodbury, Sec. Treas. Mahlon Dickerson, James K. Paulding, Sec. Navy. Amos Kendall, John M. Niles, Post. Gen.	1838. Great Western and Sirius cross the Atlantic. First shipment of wheat from Chicago.	1838. Canadian rebellion suppressed.	
1836. Massacre at Alamo, Texas. Arkansas admitted.				
Sam Houston first president of Texas.				
1837. Martin Van Buren, President; Richard M. Johnson, Vice-President				

## VI. FROM THE ADOPTION OF THE CONSTITUTION TO THE CIVIL WAR—Continued

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA			
1840. Lieut. Wilkes discovers Antarctic continent.		1839. Vulcanized rubber patented by Goodyear. John William Draper took the first photograph from life. 1840. Adams Express commenced between New York and Boston. Jonas Chickering patented the grand piano with full iron frame. 1841. Elias Howe patents the sewing machine. First steam fire-engine completed and used in New York. The first mercantile agency established. Making of Connellsville coals commenced. 1842. First factory for pocket-knives established in Connecticut.	1840. Upper and Lower Canada reunited.	1839. Termination of the Mexican-French war.			
1841. William H. Harrison, President; John Tyler, Vice-President. Harrison dies April 4th.	Daniel Webster, <i>Sec. State</i> , Thomas Ewing, <i>Sec. Treas.</i> John Bell, <i>Sec. War</i> , George E. Badger, <i>Sec. Navy</i> , Francis Granger, <i>Post. Gen.</i> John J. Crittenden, <i>Atty. Gen.</i> Daniel Webster, Abel T. Upshur, John C. Calhoun, <i>Sec. State</i> , Thomas Ewing, Walter Forward, John C. Spencer, <i>Sec. Treas.</i>	1843. Napoleon F. Guerin introduced hatching of eggs by artificial heat. The manufacture of manila grass paper was begun in Boston. Patent issued to Enos Wilder for the first fireproof safe. 1844. U. A. Boyden built the first turbine water wheel. William & Ketcham patented the first mowing machine. Morse telegraph completed from Baltimore to Washington.	1843. McGill University, Montreal, opened.				
John Tyler, President. Failure of the United States bank. 1842. Dorr's rebellion in Rhode Island. Ashburton treaty with England signed. 1843. Bunker Hill monument dedicated.	John Bell, James M. Porter, John C. Spencer, William Wilkins, <i>Sec. War</i> , George E. Badger, Abel P. Upshur, David Henshaw, Thos. W. Gilmer, John Y. Mason, <i>Sec. Navy</i> , Francis Granger, Chas. A. Wickliffe, <i>Post. Gen.</i> John J. Crittenden, Hugh S. Legaré, John Nelson, <i>Atty. Gen.</i>	1845. Petroleum discovered near Pittsburgh. United States Naval academy established at Annapolis.		1844. Dominican Republic proclaimed in Hayti.			
1844. Texas annexed to the United States.		1846. First slate quarry in Vermont opened. Elias Howe Jr. improved first sewing machine.					
1845. James K. Polk, President; George M. Dallas, Vice-President. Florida admitted. Texas admitted.	James Buchanan, <i>Sec. State</i> , Robert J. Walker, <i>Sec. Treas.</i> Wm. L. Marcy, <i>Sec. War</i> , George Bancroft, John Y. Mason, <i>Sec. Navy</i> , John Y. Mason, Nathan Clifford, Isaac Toucey, <i>Atty. Gen.</i> Cave Johnson, <i>Post. Gen.</i>		1846. Earl of Cathcart governor.	1845. England and France blockade Buenos Ayres, pending civil war. Venezuela's independence recognized by Spain.			
1846. Mexican war.				1846. Gen. Melia of Mexico issues proclamation of hostility to the United States. War with United States.			
<b>THE MEXICAN WAR; 1846-1848</b> Generals in chief: American, Winfield Scott; Mexican, Santa Anna.							
<b>CAUSES</b>	<b>PRELIMINARY EVENTS</b>	<b>RESULT</b>					
Real: The annexation of Texas. Immediate: The boundary line between Texas and Mexico.	General Taylor occupied the disputed territory. The first blood shed was near Fort Brown. War was declared by the United States May 13, 1846. War was declared by Mexico May 23, 1846.	The Treaty of Guadalupe Hidalgo. a. The Rio Grande river was made the boundary between Texas and Mexico. b. California and New Mexico were ceded to the United States. c. The United States paid Mexico \$15,000,000, and assumed \$3,500,000 due Texas citizens. It revived the slavery question in American politics.					
<b>PRINCIPAL BATTLES OF THE MEXICAN WAR</b> The Americans were victorious in every conflict.							
PLACE OF BATTLE	DATE	COMMANDERS		AMERICAN		MEXICAN	
		American	Mexican	Engaged	Casualties	Engaged	Casualties
Branite.	Dec. 25, 1846	Doniphan.	Ponce de Leon.	500	.....	1,200	.....
Buena Vista.	Feb. 23, 1847	Taylor.	Santa Anna.	4,700	723	17,000	2,000
Cerro Gordo.	April 18, 1847	Scott.	Santa Anna.	8,500	500	12,000	500
Chapultepec.	Sept. 13, 1847	Scott.	Brava.	7,200	Slight	25,000	Heavy
Contreras.	Aug. 20, 1847	Scott.	Valencia.	4,000	Slight	7,000	2,500
Churubusco.	Aug. 20, 1847	Scott.	Santa Anna.	8,000	700	25,000	700
Huamantla.	Oct. 9, 1847	Lane.	Santa Anna.	500	24	1,000	Unknown
Mexico.	Sept. 14, 1847	Scott.	Santa Anna.	6,000	.....	14,000	Surrender
Molino del Ray.	Sept. 8, 1847	Worth.	Alvarado.	3,500	787	14,000	230
Monterrey.	Sept. 24, 1846	Taylor.	Ampudia.	6,600	120	10,000	.....
Palo Alto.	May 8, 1846	Taylor.	Arista.	2,300	.....	4,000	.....
Rosaca de la Palma.	May 9, 1846	Taylor.	Arista.	2,000	120	3,500	500
Sacramento.	Feb. 28, 1847	Doniphan.	Trias.	900	.....	4,000	.....
Vera Cruz.	Mar. 27, 1847	Scott.	Morales.	12,000	19	6,000	2,000
The only naval engagements of importance during the war with Mexico were the bombardment of Vera Cruz, by Commodore Corner, which lasted four days, and the bombardment of Matanzas, Commodore Sloat, both cities being forced to surrender.							
POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS					
1848. Gold discovered near Colima, Cal. Peace signed with Mexico. Acquisition of New Mexico and California.		1847. Richard M. Hoe patented the type-revolving press. Use of adhesive postage stamps first authorized. 1848. First cast-iron-front building in the world erected in New York.					1848. Peace between United States and Mexico.

## VI. FROM THE ADOPTION OF THE CONSTITUTION TO THE CIVIL WAR—Continued

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1849. <b>Zachary Taylor</b> , President; Millard Fillmore, Vice-President. Rush of gold hunters to California begins.	John M. Clayton, <i>Sec. State</i> , George W. Crawford, <i>Sec. War</i> , Thomas Ewing, <i>Sec. Interior</i> , Jacob Collamer, <i>Post. Gen.</i> , Wm. M. Meredith, <i>Sec. Treas.</i> , Wm. H. Preston, <i>Sec. Navy</i> , Reverdy Johnson, <i>Att. Gen.</i>	1850. Export of coal first attained commercial importance. First ice machine patented. The manufacture of reed organs commenced.	1850. Riots in Montreal; Parliament house burned. Canadian clergy reserves abolished.	1850. Cuba invaded by American filibusters under Lopez.
1850. Death of President Taylor July 9th. Millard Fillmore, President. California admitted. Butler-Clayton treaty with Great Britain signed. Fugitive Slave bill passed. Hay Compromise bill passed. 1851. Great fire in library of Congress.	Daniel Webster, <i>Sec. State</i> , Chas. M. Conrad, <i>Sec. War</i> , Wm. A. Graham, <i>Sec. Navy</i> , Nathan K. Hall, <i>Post. Gen.</i> , Thomas Corwin, <i>Sec. Treas.</i> , Alex. H. Stuart, <i>Sec. Interior</i> , John J. Crittenden, <i>Att. Gen.</i>	1851. Hudson River railroad completed from New York to Albany. Western Union Telegraph company established.	1851. Second invasion of Cuba; Hayti an empire under Solouque.	1851. Second invasion of Cuba; Hayti an empire under Solouque.
1852. United States mint established at San Francisco. Deaths of Henry Clay and Daniel Webster.	Wm. L. Marcy, <i>Sec. State</i> , Jefferson Davis, <i>Sec. War</i> , Robert McClellan, <i>Sec. Interior</i> , James Campbell, <i>Post. Gen.</i> , James Guthrie, <i>Sec. Treas.</i> , James C. Dobbin, <i>Sec. Navy</i> , Caleb Cushing, <i>Att. Gen.</i>	1852. First pottery in Trenton built by Speyer, Taylor & Bloer. Lamp chimney first manufactured by Christopher Derflinger in Brooklyn.	1853. The <i>Greene</i> , first transatlantic steamer, arrives at Quebec.	1852. Slave trade suppressed in Brazil.
1853. <b>Franklin Pierce</b> , President; Rufus King, Vice-President. Walker's filibustering expedition. Golden purchase.		1853. New York clearing house established. United States Pottery company of Bennington made first inland-flooring tile.		1853. Civil war in Argentina.
1854. Treaty between United States and Japan. Kansas-Nebraska bill approved. Ostend manifesto issued.		1854. Otis Tatum patented an elevator for hotels. The first merchant flouring-mill started in Minneapolis. O. D. Dows introduced in Boston the first marble soda fountain.	1854. First petroleum wells bored.	1854-1860. Central America invaded by American filibusters under Walker.
1855. Troubles in Kansas. First agricultural college in United States established at Cleveland.		1855. Cotton-seed oil first successfully made by Paul Aldige at New Orleans. Vacuum pan introduced in the sugar refineries.	1855. Suspension bridge at Niagara falls opened.	
1856. Civil strife in Kansas. First Republican national convention.		1856. Gail Borden patented condensed milk and its manufacture commenced at Litchfield, Conn. Bessemer steel first made at Phillipsburg, N. J.	1856. Grand Trunk Railroad opened. Allan steamship line established.	
1857. <b>James Buchanan</b> , President; J. C. Breckenridge, Vice-President. Dred Scott decision.	Lewis Cass, Jeremiah S. Black, <i>Sec. State</i> , Howell Cobb, Jacob Thomas, John B. Floyd, Joseph Holt, <i>Sec. War</i> , Isaac Touney, <i>Sec. Navy</i> , Jacob Thompson, Moses Kelly, <i>Sec. Interior</i> , Jeremiah S. Black, Edwin M. Stanton, <i>Att. Gen.</i> , Aaron V. Brown, J. Holt, H. King, <i>Post. Gen.</i>	1857. Japan teas appeared in the market. Great financial panic in United States. First attempt to lay transatlantic cable.	1858. Ottawa made the capital. Decimal system of coinage adopted.	1857. New Mexico constitution established.
1858. Minnesota admitted. Second treaty with China signed.		1858. First transatlantic cable successfully laid. First message over Atlantic cable. Gold was discovered at Pike's Peak, Colorado. First cut loaf sugar made in this country.		1858. Mexican constitution annulled by church party. Civil war in Mexico. Hayti a republic.
1859. Oregon admitted. John Brown's raid.		1859. Photolithography for maps in colors was introduced. First shipment of flour from Minneapolis to the East.	1860. Prince of Wales visits Canada.	1859. Juarez of Mexico confiscates church property.
1860. Morrill high tariff bill approved. South Carolina passes ordinance of secession from the Union.		1860. The oil fever broke out in the Allegheny river valley. Salt first attained commercial importance in Michigan.		1860. Civil war in Mexico between Zuloaga and Miramon.

## VII. PERIOD OF THE CIVIL WAR, 1861-1865 A. D.

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1861. <b>Abraham Lincoln</b> , President; Hannibal Hamlin, Vice-President.	Wm. H. Seward, <i>Sec. State</i> , Simon Cameron, Edwin M. Stanton, <i>Sec. War</i> , Caleb B. Smith, John P. Usher, <i>Sec. Interior</i> , Gideon Welles, <i>Sec. Navy</i> , Salmon P. Chase, Wm. F. Pickens, <i>Sec. Treas.</i> , Edward Bates, James Speed, <i>Att. Gen.</i> , Montgomery Blair, William Dennison, <i>Post. Gen.</i>	1861. First message sent over transatlantic telegraph line. Stereotyping for newspapers introduced by the <i>New York Tribune</i> and <i>New York Herald</i> .	1861. Gold found in Nova Scotia.	1861. Juarez dictator of Mexico.
1861. Secession of Mississippi, Florida, Alabama, Georgia, Louisiana, Texas, Virginia, North Carolina, Arkansas and Tennessee.				
<b>The Civil war.</b>				

## THE CIVIL WAR

UNITED STATES	CONFEDERATE STATES	CAUSES	INFLUENCING EVENTS	RESULTS
Attack on Fort Sumter. Kansas admitted. Southern states form a confederacy. McClellan appointed commander-in-chief. Mason and Slidell taken from British vessel.	1861. <b>Jefferson Davis</b> , President; A. H. Stephens, Vice-President.	<i>Real, but remote:</i> Different constructions of the constitution. Different systems of labor in the North and the South. Lack of intercourse between the North and the South. The increase of territory. Immediate: The secession of the states.	The invention of the cotton gin, 1793. Fugitive slave laws, 1793 and 1850. Protective tariff laws. Missouri compromise, 1820. Nullification act in South Carolina, 1822. Annexation of Texas, 1845. Omnibus bill, 1850. Kansas-Nebraska bill, 1854. Dred Scott decision, 1857. Personal liberty bills, 1857. John Brown raid, 1859. Anti-slavery papers, books, and speeches. New England Anti-Slavery society was organized 1832. Anti-slavery parties: Liberty party, 1840-48. Free-Soil party, 1848-56. Republican party, 1854.	The war cost nearly one million able-bodied men. The national debt was increased to \$2,750,000,000. An incalculable amount of property was destroyed. The freedom of the slaves was secured. The Union was preserved.
Battles of Bull Run.	<b>CONFEDERATE CABINET</b> J. P. Benjamin, <i>Att. Gen.</i> , Robert Toombs, <i>Sec. State</i> , C. O. Memminger, <i>Sec. Treas.</i> , L. Pope Walker, J. A. Seddon, <i>Sec. War</i> , S. R. Mallory, <i>Sec. Navy</i> , J. H. Reagan, <i>Post. Gen.</i>			

## VII. PERIOD OF THE CIVIL WAR—Continued

CAMPAIGNS AND BATTLES (See American Battles for further details)		INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
UNITED STATES	CONFEDERATE STATES			
1862. East: Peninsular campaign. West: Opening of the Mississippi. Eastern Tennessee: to isolate the Gulf States. Fight between the <i>Merrimac</i> and <i>Monitor</i> . Slavery abolished in District of Columbia. Treaty with Great Britain for suppression of slave trade. Congress passes act to prevent polygamy in the territories. Gen. Jackson captures Harpers Ferry. Battle of South Mountain. Battle of Antietam. Greenbacks first issued. 1863. East: Virginia, Maryland and Pennsylvania. West: Mississippi opened. Eastern Tennessee. Emancipation proclamation. West Virginia admitted. Gen. Meade commander of the Army of the Potomac. Battle of Gettysburg. 1864. East: Grant's move on Richmond. Sheridan in the Shenandoah valley. West: Sherman's march from Chattanooga to Atlanta; "from Atlanta to the Sea." Thomas' campaign and its importance. U. S. Grant lieutenant-general. Fight between <i>Kearny</i> and <i>Albatraz</i> . Fugitive slave law repealed. Battle of Monocacy. Nevada admitted. President calls for 500,000 volunteers. Grade of vice-admiral established. Additional call for 300,000 volunteers. 1865. Closing in on Lee. The surrender.	1862. Capture of Ft. Henry. Grant takes Ft. Donelson. Battle of Shiloh. Capture of New Orleans by Farragut and Butler. Battle of Fair Oaks. Robert E. Lee in command of Confederate armies. Battle before Richmond. Battle of Murfreesboro. 1863. Battle of Chancellorsville. Siege of Vicksburg. Battle of Chickamauga. Battle of Lookout Mountain. Siege of Charleston. 1864. Grant's Virginia campaign. Battle of Wilderness. Battle of Spotsylvania Court. H. Battle of Cold Harbor. Atlanta campaign. Capture of Mobile. Battle of Winchester. Sherman's march to the sea. Thomas defeats Hood at Nashville. 1865. Confederate Congress adjourns <i>pro die</i> . Richmond evacuated by Confederates. Lee surrenders at Appomattox April 9th. Johnston, Morgan, Taylor and Kirby-Smith surrender. Jefferson Davis captured.	1862. Union Pacific railroad chartered. Chicago became the recognized center of the packing industry. 1863. Henry Dinton built first crucible-steel melting plant for saw steel. The channelling machine invented by George J. Wardwell, of Rutland, Vt. 1864. Northern Pacific railroad chartered. Postal money order system established. George M. Pullman built the <i>Pioneer</i> , his first car. Polished plate glass first made at Lenox, Mass. Pneumonia on gold, 285 per cent.	1862. Macdonald premier. 1863. Masise occupied by the French under Basaine. 1864. Maximilian emperor of Mexico. Hostilities between Paraguay and Brazil. American Congress at Lima, Para.	1862. England and Spain disapprove Mexican monarchy for Maximilian. 1863. Masise occupied by the French under Basaine. 1864. Maximilian emperor of Mexico. Hostilities between Paraguay and Brazil. American Congress at Lima, Para.

## VIII. PERIOD OF RECONSTRUCTION, 1865-1898 A. D.

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1865. Lincoln re-elected; Andrew Johnson, Vice-President. Peace conference at Hampton Roads. President Lincoln shot at Ford's theater, Washington, April 14th. Andrew Johnson, President; April 15th. General amnesty proclamation. Alabama restored in Northern states. 1866. Civil Rights bill passed over President's veto. Fenian raid into Canada. 1867. Nebraska admitted. Alaska transferred by Russia to the United States. 1868. President Johnson impeached, tried and acquitted. Southern states readmitted to representation in Congress. Burlingame treaty with China signed. XIV. Amendment adopted. 1869. U. S. Grant, President; Schuyler Colfax, Vice-President. Soldier's monument at Gettysburg dedicated. 1870. XV. Amendment ratified. Fenian raids.	Wm. H. Seward, Sec. State. Edwin M. Stanton, Sec. War. John P. Usher, Henry Harlan, Sec. Interior. Hugh McCulloch, Sec. Treas. Gideon Welles, Sec. Navy. James Speed, Atty. Gen. Wm. Denison, Post. Gen. Wm. H. Seward, Sec. State. Edwin M. Stanton, Lorenzo Thomas, John Schofield, Sec. War. Hugh McCulloch, Sec. Treas. Henry Harlan, Orville H. Browning, Sec. Interior. Gideon Welles, Sec. Navy. James Speed, Henry Stannard, Wm. M. Evans, Atty. Gen. Wm. Denison, Alexander W. Randall, Post. Gen.	1865. The second Atlantic cable successfully laid. Salmon canning on the Columbia river begun. 1867. First steel rails rolled by Cambria Iron company of Johnstown, Pa. Ground wood pulp first put into printing paper. 1868. First Westinghouse air-brake used. Improved typewriting machine patented by C. Latham Sholes. First Siemens-Martin open-hearth furnace built. 1869. Great Niagara suspension bridge opened. First transcontinental railroad completed by the junction of the Union Pacific and Central Pacific. 1870. Terra-cotta first generally used for building purposes. Advertisements in magazines first published.	1866. Invasion of Canada threatened by Fenians. Canadian Parliament first meets at Ottawa. 1867. Dominion of Canada formed by union of Upper and Lower Canada, Nova Scotia, and New Brunswick. New Parliament at Ottawa. 1868. Agitation against confederation in Nova Scotia. Fenian raid repelled. Sir John Young governor-general. 1869. Newfound-land refuses to join the Dominion. Hudson Bay territory purchased by the Dominion. 1870. Rupert's Land made the province of Manitoba.	1865. Argentina invaded by Paraguayans. War between Brazil and Uruguay. Treaty between Brazil, Uruguay and Argentina against Paraguay. Four years' war results. Religious toleration enacted in Chili. Chili declares war against Spain. 1866. Spaniards bombard Valparaiso, Chili. Peru joins Chili in war against Spain. 1867. Maximilian, Miramon, and Mejia tried in Mexico and shot. Republic reestablished in Mexico. 1868. Insurrection of Croes in Cuba under Cespedes. 1869. Revolution in Ecuador. Fighting again attack Cuba. 1870. Continual insurrections in Cuba.

## VIII. PERIOD OF RECONSTRUCTION—Continued

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1871. Legal Tender act decided constitutional. "Tweed Ring" in New York exposed. Great fire in Chicago. District of Columbia a territorial government. Treaty of Washington.		1871. R. Hoe & Company complete the perfecting press. Tasne Pacific railroad incorporated.	1871. British Columbia united to the Dominion. Departure of last battalion of royal troops. Uniformity of currency established. 1872. Lord Dufferin governor-general.	1871. Civil war and insurrections in Mexico.
1872. Geneva award of \$15,000,000 made to the United States. Great fire in Boston; loss \$80,000,000. Modoc war in California.	Hamilton Fish, Sec. State. Wm. D. Belknap, Alphonso Taft, J. D. Cameron, Sec. War. John A. J. Creswell, Marshall Jewell, James N. Tyner, Post. Gen.	1872. Import duties on tea and coffee abolished. The Bonanza mines on the Comstock lode discovered. Wadsworth process patented by Lowe. 1873. Westinghouse automatic air-brake introduced. Financial panic in New York.		
1873. Grant reelected; Henry Wilson, Vice-President. Credit Mobilier investigation by Congress. One-cent postal cards issued. Territorial government in District of Columbia abolished.	George M. Robeson, Sec. Navy. Columbus Delano, Zachariah Chandler, Sec. Interior. Wm. M. Richardson, Benj. H. Brewster, Lot. M. Merrill, Sec. Trans. George H. Williams, Edwards Pierpont, Alphonso Taft, Atty. Gen.	1874. The great steel bridge across the Mississippi at St. Louis completed. Bradford oil field discovered. First trunk pipe line from oil regions to Pittsburg. Barbed-wire manufacture began at De Kalb, Ill. 1875. Hoosac tunnel completed.	1873. Prince Edward island joins the Dominion.	1873. Treaty between Argentina and Brazil. Slavery abolished in Porto Rico. 1874. Religious orders suppressed in Mexico.
1875. Act authorizing the resumption of specie payments. 1876. Souda war. Massacre of Custer's troops by Sitting Bull. Colorado admitted. 1877. Electoral commission appointed.		1876. Bell secured his first patent for the telephone. Centennial exposition at Philadelphia. 1877. Bell's improved telephone put into general use. Goodyear welt machine brought out. Col. A. G. Pope has the first bicycle built in this country. Great railroad strike.	1875. Icelandic settle in Northwest territories. 1876. Intercolonial railroad opens from Quebec to Halifax. 1877. Great fire at St. John, New Brunswick.	
Rutherford B. Hayes, President; Wm. A. Wheeler, Vice-President. "Molly Maguires" hanged in Pennsylvania. War with the Nez Percé Indians. 1878. Bland silver bill passed over President's veto.	Wm. M. Everts, Sec. State. R. W. Thompson, Nathan Goff Jr., Sec. Navy. D. M. Key, Horace Maynard, Post. Gen. John Sherman, Sec. Trans. G. W. McCrary, Alex. Ramsey, Sec. War. Carl Schurz, Sec. Interior. Charles Devens, Atty. Gen.	1878. Subdivision of the electric current accomplished by Edison, and incandescent lights introduced. Blaik transmitter for telephones brought out. 1879. Bee-keeping on a large scale introduced by the packing houses. French Atlantic cable laid.	1878. Marquis of Lorne governor-general.	1878. Surrender of insurgent government in Cuba.
1879. United States government resumes specie payment. Women permitted to practice before United States courts. 1880. The Kearney agitation in California.		1880. Edison built the first electric road at Menlo Park.	1879. Industrial exhibition at Ottawa.	1879. War between Chili and Peru and Bolivia.
1881. James A. Garfield, President; Chester A. Arthur, Vice-President. President Garfield shot July 2d.	J. G. Blaine, Sec. State. R. T. Lincoln, Sec. War. W. H. Hunt, Sec. Navy. Wayne MacVeagh, Atty. Gen. Wm. Windom, Sec. Trans. S. J. Kirkwood, Sec. Interior. W. L. James, Post. Gen. J. G. Blaine, F. T. Frelinghuysen, Sec. State. R. T. Lincoln, Sec. War. W. H. Hunt, W. E. Chandler, Sec. Navy. Wayne MacVeagh, B. H. Brewster, Atty. Gen. C. J. Folger, Sec. Trans. S. J. Kirkwood, H. M. Teller, Sec. Interior. T. L. James, T. O. Howe, Post. Gen.	1881. International cotton exposition at Atlanta, Ga.	1880. Royal Canadian academy of arts founded. 1881. Contract for new Pacific railway ratified.	1880. Buenos Ayres made the capital of Argentina. 1881. Lima occupied by the Chileans. Patagonia divided by Chili and Argentina.
Chester A. Arthur, President, September 20th. 1882. Star Route trials begin. War with the Apache Indians. Anti-Chinese bill.		1882. Bill passed to extend the charters of the national banks.	1882. Northwest territory beyond Manitoba divided into Assinibola, Saskatchewan, Alberta and Athabasca. First colony of Russian settlers in Northwest territory.	
1883. Northern Pacific railroad completed.		1883. The Brooklyn bridge opened. First canneries for Alaska salmon established.	1883. Conflicts between Catholics and Orangemen in Newfoundland. Standard time adopted. 1884. Marquis of Lorne governor-general.	1883. Ancient city discovered in Sonora, Mexico. Peruvians defeated with great loss by Chili. 1884. Porfirio Diaz president of Mexico.
1884. Great floods in the Ohio valley.		1884. Telephone wires first put underground. Financial crisis in New York.	1885. The Riel Insurrection in northwest.	1885. Concessions to the Nicaragua Canal company granted by Nicaragua. 1886. Slavery abolished in Cuba.
1885. Grover Cleveland, President; Thomas A. Hendricks, Vice-President. Apache war in New Mexico.	Thos. F. Bayard, Sec. State. Wm. C. Endicott, Sec. War. Wm. C. Whitely, Sec. Navy. Wm. F. Vilas, Don M. Dickinson, Post. Gen. Daniel Manning, Chas. Fairchild, Sec. Trans. Augustus Garland, Atty. Gen. Lucius Q. C. Lamar, William F. Vilas, Sec. Interior. Norman J. Coleman, Sec. Agric.	1885. Long-distance telephone introduced to use. World's Industrial exposition at New Orleans.	1886. Fisheries dispute with United States. Vancouver city founded. 1887. Great railway bridge at Lachine completed.	
1886. Silver certificates authorized. Bartholdi's statue of Liberty unveiled.		1886. Railroad strikes and anarchistic riots. Wire nails first manufactured. Experiments made with electrical locomotives on the elevated road in New York. 1887. First vestibule Pullman train in service. Beet sugar first successfully produced at Alvarado, Cal.	1888. Lord Stanley governor-general.	1888. Slavery totally abolished in Brazil.
1887. Interstate commerce bill.		1888. The first electric street-railway was built by Frank J. Sprague at Richmond. 1889. Department of Agriculture created. Johnstown flood.		1889. Revolution at Rio de Janeiro, emperor banished; republic declared. First Brazilian congress meets.
1888. Chinese immigration prohibited.				
1890. Benjamin Harrison, President; Levi P. Morton, Vice-President. Pan-American congress meets in Washington. North and South Dakotas, Washington and Montana admitted. Oklahoma opened for settlement.	James G. Blaine, John W. Foster, Sec. State. Richard Prentiss, Sec. War. Benj. F. Tracy, Sec. Navy. John W. Wainwright, Post. Gen. William Windom, Sec. Trans. William H. H. Miller, Atty. Gen. John W. Noble, Sec. Interior. Jeremiah M. Rusk, Sec. Agric.			

## VIII. PERIOD OF RECONSTRUCTION—Continued

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1890. Idaho and Wyoming admitted. People's party convenes at Topeka, Kan. McKinley tariff bill goes into effect. Sins war; Sitting Bull killed. 1891. Silver purchase act. 1891. Manners of Italians in New Orleans. 1892. Behring Sea dispute referred to arbitration. 1893. Grover Cleveland, President. Adlai E. Stevenson, Vice-President. World's parliament of religions meets at Chicago. Chinese exclusion bill approved. 1894. Wilson tariff bill passed. Republic of Hawaii recognized. New treaty with Japan. 1895. Free silver movement an important issue. Special message of the President on the Venezuelan question. 1896. Treaty with the Choctaw Indians.	Richard Olney, Sec. State. Daniel R. Lamont, Sec. War. Hilary A. Herbert, Sec. Navy. Wm. L. Wilson, Post. Gen. John G. Carlisle, Sec. Treas. Judson Hartman, Att. Gen. David R. Francis, Sec. Int. J. Sterling Morton, Sec. Agric.	1891. The first railroad passenger train ran to the summit of Pike's Peak. 1892. Long-distance telephone line between New York and Chicago formally opened. A Vaucain compound-locomotive attained a speed of 97 miles an hour. 1893. Great Northern railroad finished. Edison's kinesiograph or vitascope patented. World's Columbian exposition opens at Chicago. Agitation for free coinage of silver, and for repeal of Sherman silver law. Great financial depression. Silver bill approved. 1891. Long distance telephone between Chicago and Washington tested. National coal miners' strike, and Debs insurrection. New Anglo-American cable finished. Great railroad strike from Ohio to Pacific coast. 1895. Largest spectroscopic in world made at Pittsburgh. Hartley canal opened. 1896. Great agitation for the free coinage of silver. Banks of New York turn \$25,000,000 of gold over to treasury. Niagara falls electric power turned on in Buffalo, N. Y.	1890. Dominion Commons passed a resolution of loyalty to Great Britain. 1891. Canadian Pacific railway completed. 1892. Dominion discriminates against United States in use of Welland canal. 1893. Canal tolls arranged with United States. Commercial treaty between France and Canada. Earl of Aberdeen governor-general. 1894. Intercolonial congress opened at Ottawa. 1895. First exhibition in Northwest opened at Regina. 1896. Sir Charles Tupper premier. Newfoundland purchases railway system.	1890. Great financial crisis in Argentina. Uncon of Central American states (formal). 1891. Civil war in Chili. 1892. Revolutions and insurrections in Brazil. 1893. Insurrections in Argentina. Naval revolt in Brazil by Admiral de Mello. 1894. Naval armistice between Admiral de Gama, Brazilian insurgent, and Admiral Leatham, United States navy. 1895. Chili adopts the gold standard. Cuba demands autonomy from Spain. 1896. Weyler issues his reconcentrado order in Cuba. Gold mines of great value discovered in Peru.

## IX. PERIOD OF NATIONAL EXPANSION, 1897-1911

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1897. William McKinley, President. Garret A. Hobart, Vice-President. Universal postal congress meets in Washington. Treaty for annexation of Hawaii signed. Dingley tariff bill goes into effect. 1898. City government of Greater New York inaugurated. Destruction of the Maine in Havana harbor. War with Spain; Congress orders forcible intervention in Cuba.	John Sherman, William R. Day, John Hay, Sec. State. Russell A. Alger, Elihu Root, Sec. War. John D. Long, Sec. Navy. James A. Gary, C. Emory Smith, Post. Gen. Lyman S. Gage, Sec. Treas. Joe McKenna, John W. Giggles, Att. Gen. Cornelius N. Bliss, E. Allen Hitchcock, Sec. Int. James Wilson, Sec. Agric.	1897. Iron-mining strikes among coal and iron miners. The steel rail pool collapses. Sextuplex telegraphy invented. United Pacific railroad sold to the reorganization committee. 1898. Commercial treaty with France signed. Method of mercerizing cloth under tension to make it silky patented. Horry and Bradley's process of making calcium carbide patented.	1897. School question settled in Manitoba. Commission for Yukon gold region appointed. British Science association meets at Toronto. Joint commission appointed to settle difficulties with United States. 1898. Great influx of miners to Yukon gold region. Earl of Minto governor-general.	1897. Venezuela ratifies boundary treaty with Great Britain. Weyler recalled from Cuba and Blanco appointed captain-general. Attempt to assassinate President Diaz of Mexico. United States of Central America formed. 1898. Hostile demonstrations in Havana against Americans. Battleship Maine blown up at Havana.

## SPANISH-AMERICAN WAR, 1898

CAUSES	RESULTS	THE NAVY
Real: Spanish oppression in Cuba. Immediate: The blowing up of the Maine.	The Treaty of Paris: Spain gave up all title to Cuba. Spain ceded Porto Rico, Guam and the Philippines to the United States. The United States gave Spain \$20,000,000. The direct cost of the war to the United States was about \$130,000,000. Soldiers killed, 430. A larger number died of disease. The United States has become the guardian of Cuba. An increase in our navy and standing army. The question of territorial expansion in our politics.	American Vessels: Olympia, Bainbridge, Raleigh, Boston, Concord, Petrel. American Commander: Geo. Dewey. Spanish Vessels: Albatros, Cristóbal, Colón, Viscaya, Infanta Maria Teresa, and torpedo boat Pluton and Furor. Spanish Commander: Admiral Montijo. American Casualties: Seven men slightly injured. No damage to ships. Before Santiago, July 3, 1898. American Vessels: Brooklyn, Texas, Oregon, Iowa, Gloucester. American Commander: Winfield Schley. Spanish Casualties: All ships destroyed, 450 men killed and wounded. Spanish Vessels: Albatros, Olympia, Cristóbal, Colón, Viscaya, Infanta Maria Teresa, and torpedo boat Pluton and Furor. Spanish Commander: Admiral Cervera. The total number of vessels captured from Spain during the war of 1898 was 58.
THE ARMY		
ENGAGEMENTS—THE ARMY		
		OUR LOSERS
		Killed Wounded
Bombardment of Cienfuegos, May 11, 1898....	1	11
Bombardment of San Juan, May 12, 1898....	1	7
Guantanamo, June 11-20, 1898....	6	134
Bombardment of Santiago, June 22, 1898....	1	9
Santiago campaign, June 21-July 17, 1898....	260	161
Porto Rico campaign, July 25-26, 1898....	3	40
The reduction of Manila, August 13, 1898....	17	108

## IX. PERIOD OF NATIONAL EXPANSION—Continued

POLITICAL EVENTS	CABINET OFFICERS	INDUSTRIAL PROGRESS	CANADA	LATIN AMERICA
1898. Treaty of Paris: United States acquires sovereignty over Cuba, Porto Rico, and the Philippines. 1899. Aguinaldo forecasts the Philippine war. Appointment of the first Philippine commission. General Wood governor of Cuba.		1899. American Steel and Wire company incorporated. Heavy iron duty business ever transacted on the New York stock exchange, January 23. Unprecedented commercial and trade prosperity.	1899. Adjournment of the joint high commission. 1900. Great fire in Ottawa. Liberal ministry in power.	1899. Cuba and Porto Rico pass to United States by Treaty of Paris. Spanish power in America ceases.
1900. Civil government established in the Philippines under act of Congress. Civil government in Alaska. American forces sent to China under General Chaffee. 1901. McKinley reflected; Theodore Roosevelt, Vice-President. Platt amendment relating to Cuban independence passed. President McKinley shot at Buffalo, N. Y., September 6th. Theodore Roosevelt, President, September 14th. Cuban autonomy granted. 1902. President recommended purchase of the rights of the Panama Canal company for \$40,000,000. Civil government established in the Philippines and amnesty granted political prisoners. Decision of United States Supreme Court in Northern Securities case.	Joho Hay, Elihu Root, Robert Bacon, Sec. State, Elihu Root, W. H. Taft, Luke E. Wright, Sec. War, John D. Long, W. H. Moody, Paul Morton, C. J. Bonaparte, V. H. Metcalf, T. H. Newberry, Sec. Navy, Lyman J. Gage, Leslie M. Shaw, G. B. Cortelyou, Sec. Treas., E. A. Hitchcock, J. B. Garfield, Sec. Interior, James Wilson, Sec. Agric., C. E. Smith, H. C. Payne, R. J. Wynne, G. B. Cortelyou, G. von L. Meyer, Post. Gen., Philander C. Knox, W. H. Moody, C. J. Bonaparte, At. Gen., G. B. Cortelyou, V. H. Metcalf, Oscar S. Straus, Sec. Com. and Labor.	1900. Currency bill approved. Commercial treaty with Italy ratified. 1901. United States Steel Corporation formed. Pan-American exposition at Buffalo. Northern Securities company organized. Isthmian canal treaty signed. 1902. Strike of San Francisco street car operatives. War revenue tax abolished. British American Tobacco company formed. Strike of anthracite coal miners; President Roosevelt appoints commission. 1903. Department of Commerce and Labor established. Reciprocity treaty with Cuba ratified. Commercial treaty with China ratified. Pacific cable completed. Canal treaty with Panama.	1901. Population of Canada, 5,338,863. Toronto exposition opened. 1902. Canadian-Australian cable. Reciprocity treaty between Newfoundland and United States. 1903. University of Ottawa founded.	1901. War declared between Venezuela and Colombia. 1902. Gen. Urbie, Colombian insurgent leader, surrenders. End of revolution in Venezuela. Revolution in San Domingo.
1903. Lieutenant-General Miles retired from head of the U. S. Army. Alaskan boundary tribunal in London decided in favor of the United States.		1903. Oil for fuel on steam vessels again practical test. Payment of \$40,000,000 made to Panama Canal company. Meat-packers strike in Chicago and elsewhere.	1904. Earl Grey demonstration. Fire in Toronto destroys \$10,000,000 worth of property.	1904. Venezuelan diplomatic relations with United States.
1904. Arbitration treaty with France signed. Great fire in Baltimore.		1905. Best trust declared illegal by United States Supreme Court. Panama government law enacted and work on the canal commenced. Investigation of insurance companies in New York begins.	1905. Decennial census act. Movement to secure the confederation of the British West Indies.	1906. Decennial census act. Movement to secure the confederation of the British West Indies.
1905. Theodore Roosevelt, President; Charles W. Fairbanks, Vice-President. President advocates control of railroads and corporate wealth. Arbitration treaties concluded with Great Britain, Germany, Italy and other powers. 1906. Destruction of San Francisco by earthquake and fire. Riot at Brownsville, Texas. President Roosevelt visits Panama. Battle of Joliet, Philippines.		1906. American Sugar Refining Company convicted of receiving rebates. Pure food and meat inspection law enacted. Standard Oil company indicted. Work commenced on Panama canal.	1906. British preferential tariff debated. Commission appointed to investigate life insurance in Canada.	1906. Pan-American conference at Rio de Janeiro. Earthquake at Valparaiso, Chili. Palme resigns presidency of Cuba.
1907. Great floods at Pittsburgh. Oklahoma admitted as a state. U. S. fleet starts on world voyage.		1907. Price of cotton reached highest point since 1876. Jamestown exposition opens. Commercial agreement established with Germany. Inland waterways commission appointed by President Roosevelt. Belmont tunnel opened in New York. New York-Havana cable completed. Standard Oil company fined \$29,240,000.	1907. Riotous demonstration against Japanese at Vancouver. British Columbia Physical and military training introduced into schools and colleges.	1907. Notable impulse given to South American trade and progress. Tehuacan National railway opened by President Diaz of Mexico.
1908. The Aldrich currency bill introduced in the U. S. Senate. U. S. remits Chinese indemnity of \$11,000,000.		1908. Tunnel under East river, connecting Manhattan and Brooklyn, opened. Great strike of anthracite coal miners in Pennsylvania. National conservation commission convened at Washington.	1908. Industry and education strongly accentuated throughout the Dominion.	1908. Preliminary plan for Central American federation formed. Vast municipal improvements in Rio de Janeiro.
1909. William H. Taft, President; James S. Sherman, Vice-President. U. S. fleet returns from world voyage. Payne-Aldrich tariff law enacted. Hudson-Fulton celebration in New York. President Taft and Diaz met at El Paso, Texas, and exchanged friendly greetings.	Philander C. Knox, Sec. State, James Wilson, Sec. Agric., J. M. Dickinson, Henry L. Stimson, Sec. War, R. A. Ballinger, Walter L. Fisher, Sec. Int., George von L. Meyer, Sec. Navy, James Wilson, Sec. Agric., F. H. Hitchcock, Post. Gen., G. W. Wickham, Atty. Gen., Charles Nagel, Sec. Com. and Labor.	1909. Alaska-Yukon-Pacific exposition held at Seattle. Tunnel under Hudson river completed. 1910. Postal savings bank law approved. Tariff board and commission established. Telegraph and telephone companies put under the jurisdiction of the interstate commerce commission.	1909. Arbitration treaty signed in Washington between Canada and United States.	1909. Ex-President Gálvez expelled from France.



## HISTORY OF NATIONS AND IMPORTANT DEPENDENCIES

**Abyssinia** is a part of what was anciently called Ethiopia; *tyopopia* is still the Abyssinian name of the country. The first mention of it is in the native tradition, was Menelik or Menelik, the son of Solomon and the Queen of Sheba. Christianity was introduced in the fourth century by Frumentius; the kingdom of Axum, named from the capital, was the nucleus of the state, and attained its greatest extent in the sixth century. From the commencement of the church of Abyssinia, which was the mother-church of Egypt, and with her adopted the Monophysite doctrine; and the metropolitan bishop or abuna continues to be nominated by the emperor.

The modern history of Abyssinia has been mainly struggles between the princes of various districts for supreme power. About 1850 an Amharic adventurer obtained dominion over successive provinces, and in 1855 had himself crowned, under the name of Theodore, as Negus of Abyssinia. His maltreatment of European political agents and missionaries led to the British expedition under Lord Napier, which stormed Magdala. Theodore's royal fortress, whereupon Theodore died by his own hand. Johannes, King of Tigré, was the next ruler, and on his death in 1889, Menelik of Shoa succeeded to the empire. Meanwhile Italy had occupied the flats on the coast, now the Italian dependency of Eritrea (with Massawa as headquarters).

By a convention of 1889 Abyssinia became almost an Italian protectorate; but after the battle of Adowa (1896), disastrous to the Italians, Italy fully recognized Abyssinian independence. In 1906 an agreement was signed by Great Britain, France, and Italy to preserve the integrity of Abyssinia.

**References.**—*Ben's Sacred City of the Ethiopians*; *Gleichen's With the Mission to Menelik*; *Vivian's Abyssinia*; *Wright's Modern Abyssinia*; *Sinclair's Abyssinia of To-Day*.

**Afghanistan.**—The history of Afghanistan as an independent state dates only from the middle of the eighteenth century. For centuries before, Herat and Kandahar had been in the possession of Persia; while Kabul was included in the Mogul empire of Delhi. Upon the death of Nadir, in 1747, the Afghans and Shah Durani subjugated the different provinces, and when he died in 1773, left an empire to his son, Timur Shah.

The chief events in the history of Afghanistan are the expedition in 1839 which established Shah Shojah on the throne; the rebellion of 1841, in which the residents Burnes and Macnaghten were killed, and the Anglo-Indian troops perished in the retreat; the punitive expedition in 1842; the defeat of Dost Mohammed in 1849; the war with Shere Ali in 1878-79; and installment of Yakub Khan; the rising at Kabul and murder of Cavanagh the English resident; the punitive expedition under Lord Roberts; the establishment in 1881 of British suzerainty; Abdurrahman, succeeded in 1901 by his son Habibullah; and alarm as to Russian encroachments. The independence of the country, however, was guaranteed by the Anglo-Russian agreement.

**References.**—*Curzon's Russia in Central Asia*; *Forbes' Afghan War*; *Lane-Poole's Mohammedan Dynasties*; *Robert's Afghan Campaign*; *Indo*; *Gray's At the Court of the Amir*; *Colquhoun's Russias against India*; *Mohammed Khan's Conquest and Loss of Afghanistan*; *Warburton's Eighteen Years in the Khyber*; *Martin's Under the Absolute Emir*.

**Argentine Republic, or Argentina.**—In 1516 the estuary of La Plata was discovered by Juan Diaz de Solis, who, with his companions, were killed and devoured by the natives. In 1526, Sebastian Cabot visited the Plata, and one of his captains, ascending the Paraná, built a fort at the mouth of the Caracaras. The Emperor Charles V. subsequently sent out an expedition in 1580, commanded by Mendoza, who founded the city of Buenos Ayres, in 1535. The Spaniards, after the lapse of half a century, resumed in establishing their prime colony, built cities, and founded Jesuit missions.

In 1726 the Portuguese, jealous of the ascendancy of Spain, founded the city of Montevideo in the Banda Oriental. In 1776

the Plata provinces were separated from the government of Lima, and formed into the viceroyalty of Buenos Ayres. In 1806, a British expedition was dispatched to the Rio de la Plata, and captured Buenos Ayres, which was ultimately retained by the Spaniards. A second attack met with no better result. In 1808 the Spaniards revolted, deposed the viceroy, and declared a provisional government. After a protracted struggle with the colonies, they accomplished their independence.

Between 1810 and 1835 the Argentine province had no fewer than thirty-six changes of government. In the last-mentioned year, Rosas was elected president, with dictatorial powers. He ruled the country with an iron tyranny for seventeen years, sought to bring the Banda Oriental, or Uruguay (as it is now termed), under his control, and also to exclude foreign commerce from the river Plata. Upon this, France and England blockaded Buenos Ayres, occupied Montevideo, and captured the Argentine fleet. In 1849 a peace was concluded.

In 1851 Brazil and Paraguay, objecting to the control of Rosas over the navigation of the Rio de la Plata, declared against the Argentine Republic. Their confederated forces, amounting to 18,000 men, utterly defeated Rosas in the battle of Caceres, or Pacheco, in 1852. The Argentine Republic was then declared open to the world; and in 1853, the present constitution was established. After the fall of Rosas, the government was successively assumed by Gen. Urquiza and 1862; and, in 1860, by Gen. Mitre. In 1862 Buenos Ayres was declared the capital of the Argentine Republic, which continued to be until 1908, when Rosario was made the seat of the federal government.

When the ambitious designs of Lopes, the dictator of Paraguay, led to a war with Brazil, the Argentine Republic took a neutral attitude, but upon the refusal of Mitre to allow the Paraguayan troops passage through his territory, Lopes crossed the Paraná, and invaded the Argentine Republic, with his vessels, as well as the persons of Argentine subjects, upon whom he levied blackmail. These outrages obliged the Argentine Republic to ally itself with Brazil against the common enemy. A long and sanguinary war followed, with varying success, until the fall of Angotera, the last stronghold of Lopes, which was taken by the allies on Dec. 22d, 1868, after a desperate resistance.

After a wise and popular rule, Gen. Mitre was succeeded as president, in 1880, by Senhor Domingo Sarmiento. In 1874 an insurrection broke out in Buenos Ayres, which was suppressed in 1875, and the president resigned in 1880, and was succeeded by Dr. Colman, in 1886. In 1890 financial troubles and political turmoil seriously injured the well-being of what was long the best governed and most prosperous of South American States. Dr. Saenz Pena has been president since 1910.

**References.**—*Turner's Argentina and the Republic*; *Turner's Spanish Republic*; *Reichel's Campbell's Through Patagonia*; *Fitchard's Through the Heart of Patagonia* (1902); *Mohall's The River of the Plata*; *Wright's Argentine Directory and Argentine Commercial Guide*; *Koebe's Modern Argentina*.

**Australia.**—It is doubtful when Australia was first discovered by Europeans. Between 1521 and 1542 the Portuguese published the existence of a land which they called Great Java, and which corresponded to Australia, and probably the first discovery of the country was made by them early in the sixteenth century.

The first authenticated discovery is said to have been made in 1601, by a Dutchman named Manoel Godinho de Eredia. In 1606 Torres, a Spaniard, passed through the strait that now bears his name, between New Guinea and Australia. Between the years 1628 and 1628 a large portion of the coast-line of Australia had been surveyed by various Dutch navigators. In 1664 the continent was named New Holland by the Dutch govern-

ment. In 1688 Dampier coasted along part of Australia, and about 1760 explored a part of the western and northwestern coasts. In 1770 Cook carefully surveyed the east coast, named a number of localities, and took possession of the whole of the continent. This was followed by Bligh in 1789, who carried on a series of observations on the north-east coast, adding largely to the knowledge of the physical features of the country. He had now arrived on the soil, and a penal settlement was formed (1788) at Port Jackson. In this way was laid the foundation of the future colony of New South Wales.

The Moreton Bay district (Queensland) was settled in 1825; in 1835 the Port Phillip district. In 1861 the latter district was erected into a separate colony under the name of Victoria. Previously to this time the colonies both of Western Australia and of South Australia had been founded—the former in 1829, the latter in 1836. The latest of the colonies is Queensland, which only took an independent existence in 1859.

The discovery of gold in abundance took place in 1851 and caused an immense excitement throughout the colony. In 1840 the population was then only about 350,000, and was slowly increasing; but the discovery of the precious metal started the country on a rapid career of growth, which has since been almost uninterrupted.

Convicts were long sent to Australia from the mother country, but transportation to New South Wales was discontinued in 1840, and the last convict vessel to Western Australia arrived in 1868. Altogether about 70,000 convicts were landed in Australia (besides smaller numbers of convicts). Owing to the discovery of gold, the population of Western Australia was so increased that responsible government was granted in 1893.

The record of the Australasian forms an interesting part of Australian history. This has been going on since early in the century, and is as yet far from complete.

The five Australasian states, comprising the five Australian states (heretofore colonies) and Tasmania, was sanctioned by the British Parliament on July 9, 1900, and proclaimed at Sydney on February 1, 1901. In 1905 the administration of the colony transferred to the Commonwealth, and, in 1908, a customs tariff act passed giving preferential rates to Great Britain.

**References.**—*Cockburn's Australian Federation*; *Collingridge's Discovery of Australia*; *Fine-Hatton's Adams' Australia*; *Garnett's Coming Commonwealth*; *Gray's Australia, Old and New*; *Jenks' History of Australia*; *Rever's State Experiments*; *Saunders' Australia*; *Wright's History of Australia*; *the Year Book of Australia*.

**Austria-Hungary.**—The empire of Austria arose from the smallest beginnings at the end of the eighth century. In 796 a margrave, called the eastern mark (i. e., march or frontier-land), was founded as an outpost of the empire of Charlemagne, in the country of the Danube, and the name of *March*. The name *Oesterreich* appears first in 990.

In 1156 the mark was raised to a duchy; and after coming into the possession of the house of Habsburg in 1279, it rapidly rose to be a powerful state. The princes of that house extended their dominion by marriage, by purchase, and otherwise, over a number of other lands, including the crowns of Bohemia and Hungary; and from 1438 down to the nineteenth century they held almost without interruption the throne of the German empire (sacredly during the Holy Roman empire), the emperor being the most conspicuous, if not always the most powerful personage among the crowned heads of Europe.

In 1806 Francis declared himself hereditary Emperor of Austria, and two years afterward resigned the dignities of German emperor and king of the Romans. Thereafter, especially during the Holy Roman empire, the 50, Austria held the preëminence among German states; but after the victory of Prussia at Königgrätz (Sadova), in the short but bloody war of 1866, the position of Austria was excluded from Germany, and exclusion made final by the reconstruction of the German empire with the kings of Prussia as hereditary German emperors.

Since 1866 Austria has been occupied chiefly with the internal affairs of the empire. Hungarian demands for self-government were finally agreed to, and the empire of Austria divided into the two parts already mentioned—the Cisleithan and the Transleithan. This settlement was consummated by the coronation of the Emperor Francis Joseph I. at Budapest, as King of Hungary, on the 8th of June, 1867. In the same year the Concordat of 1855 came up for discussion, and measures were passed for the reestablishment of civil marriage, the emancipation of schools from the domination of the church, and the placing of different creeds on a footing of equality. The fact of the Austro-Hungarian dominions comprising so many

different nationalities has always given the central government much trouble, both in regard to internal and to external affairs. In regard to the "Eastern question," for instance, the action of Austria has been hampered by the sympathies shown by the Magyars for their blood relations, the Turks, while the Slavs have naturally been more favorable to Russia.

During the war between Russia and Turkey in 1877-8 Austria remained neutral; but at its close, in the middle of 1878, it was decided, at the Congress of Berlin, that the provinces of Bosnia and Herzegovina should in future be administered by Austria-Hungary instead of Turkey. Since that time the external history of the Austro-Hungarian monarchy

has been uneventful, but in internal affairs there has been considerable friction between the different nationalities and the numerous political parties. An anti-Semitic agitation assumed vast proportions in 1895, and resulted in the Czechs carrying the Bohemian diet. More internal unrest has recently been displayed in Austria-Hungary than in any other nation of Europe, Turkey excepted. In 1907-8 socialist demonstrations in favor of universal suffrage were frequent and impressive. In 1909 Bosnia and Herzegovina became absolute possessions.

References.—Bryce: *The Holy Roman Empire*; Fisher: *The Medieval Empire*; Fiebermann: *Prussia and Its People*; Drage: *Austro-Hungary*; Whitman: *Austria*.

## NOTABLE BATTLES OF UNIVERSAL HISTORY

Dates of events in this table are according to the Julian calendar (Old Style) until the promulgation of Gregorian calendar (New Style) in 1582. For events occurring within the limits of Great Britain the events are Old Style until the acceptance by Parliament of the Reformed calendar in 1752. In the seventeenth century the difference between the New Style and the Old was ten days, and in the eighteenth century eleven days. The victorious contestant is printed in bold-face type.

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	CONTESTANTS	REMARKS
Abernberg ( <i>a'-ber-n-berg</i> )	1800, Apr. 20.....	Bavaria.....	French and Bavarians; Austrians	About 80,000 engaged on each side.
Aboukir ( <i>a-bou-keer</i> ), Battle of the Nile.....	1798, Aug. 1.....	Egypt.....	English; French.....	Nelson cut off Napoleon's return to Europe.
Aboukir.....	1799, July 25.....	Egypt.....	French; Turks.....	Two-thirds of Turkish troops killed.
Abydos ( <i>a-bi-dos</i> ).....	B. C. 411.....	Hellepont.....	Athenians; Peloponnesians.....	
Acragas ( <i>ak'-ra-gas</i> ), Siege of Acra ( <i>a'-ker</i> or <i>a'-ker</i> ), Siege of.....	B. C. 406..... 1169-1191.....	Sicily..... Syria.....	Carthaginians; Greeks..... Christians; Saracens.....	The citizens evacuated the fortress. Richard the Lion Hearted won renown by this siege.
Acra, Siege of.....	1799, Mar. 17.....	Syria.....	Turks; French.....	
Actium ( <i>ak'-shum</i> ).....	B. C. 31, Sept. 2.....	Greece.....	Augustus; Antony.....	At the critical moment Antony and Cleopatra sail away. Italians routed with enormous loss.
Adowa ( <i>ad'-o-va</i> ).....	1896, Mar. 1.....	N. E. Africa.....	Ethiopians; Italians.....	Italians routed with enormous loss.
Adrianople ( <i>ad'-ri-an-d'po</i> ).....	323, July 3.....	Thrace.....	Constantine; Licinius.....	Constantine gained empire.
Adrianople.....	378.....	Thrace.....	Visigoths; Romans.....	Emperor Valens defeated and slain.
Adwalton ( <i>ad'-wal-ton</i> ).....	1643, Jan. 30.....	England.....	Royalists; Parliamentarians.....	
Ægion ( <i>eg'-ion</i> ).....	B. C. 241.....	Sicily.....	Romans; Carthaginians.....	This victory put an end to the first Punic war.
Ægospotami ( <i>eg'-o-spot'-a-mi</i> ).....	B. C. 405.....	Thrace.....	Spartans; Athenians.....	Virtually ended Peloponnesian war.
Aghrim ( <i>ag'-rim</i> ).....	1691, July 12.....	Ireland.....	William III; James II.....	Irish savagely slaughtered.
Acinouret ( <i>ak'-shum-er</i> ).....	1415, Oct. 25.....	France.....	English; French.....	Great victory for Henry V.
Agratello ( <i>ag'-ra-tel-lo</i> ).....	1509, May 14.....	Italy.....	French; Venetians.....	One of the most disastrous battles in the history of Venice.
Argentum ( <i>ag'-ri-jen-tum</i> ), Siege of.....	B. C. 262.....	Sicily.....	Romans; Carthaginians.....	
Alamo ( <i>a'-la-mo</i> ), Storming of the.....	1836, Feb. 22.....	Texas, U. S. ....	Mexicans; Texans.....	Survivors put to the sword.
Albuera ( <i>al-bu-er'-ra</i> ).....	1811, May 16.....	Spain.....	British; French.....	Heavy losses on both sides.
Aleppo ( <i>al-lep'-o</i> ).....	638.....	Syria.....	Moslems; Syrians.....	Last serious resistance in Syria to the invading Moslems.
Alexandria ( <i>al-ek'-s-an-d'-ri-a</i> ), Siege of.....	638.....	Egypt.....	Moslems; Egyptians.....	Left Moslems masters of Egypt.
Alexandria, Bombardment of.....	1882, July 11-12.....	Egypt.....	English; Arabi Pasha.....	Fort totally destroyed. English occupy Egypt.
Algiers ( <i>al-jer'</i> ), Bombardment of.....	1816.....	Algiers.....	English and Dutch; Day of Algeria.....	Dutch agreed to total abolition of Christian slavery in his dominion.
Alia ( <i>al'-i-a</i> ).....	B. C. 390.....	Italy.....	Brennus and his Gauls; Romans.....	Rome left defenseless.
Alma ( <i>al'-ma</i> ).....	1843, Sept. 20.....	Crimea.....	English and French; Russians.....	British carried heights at the point of the bayonet.
Almanza ( <i>al-man'-sa</i> ).....	1707, Apr. 25.....	Spain.....	French; British and Portuguese.....	Spain lost to the allies.
Amphipolis ( <i>am-fip'-o-lis</i> ), Siege of.....	B. C. 422.....	Thrace.....	Spartans; Athenians.....	Both Brasidas and Cleon fell.
Anaquito ( <i>an-a-ki-to</i> ).....	1546.....	Peru.....	Pizarro; Viceroy Menes.....	Government of Peru fell into Pizarro's hands.
Angora ( <i>an-g'-ra</i> ).....	1402.....	Asia Minor.....	Tartars; Turks.....	Tartars said to have had 800,000 men.
Antietam ( <i>an-ti'-tam</i> ).....	1862, Sept. 17.....	Maryland, U. S. ....	*Confederates; Federals.....	Heavy losses on both sides. Lee's army greatly outnumbered.
Antioch, Siege of.....	1097-1098.....	Syria.....	Crusaders; Saracens.....	Defenders massacred.
Antwerp ( <i>ant'-werp</i> ).....	1578.....	Belgium.....	Spaniards; Walloons.....	Massacre of inhabitants known as the "Spanish Fury."
Aquæ Sextie ( <i>a'-ue-sek'-ti</i> ).....	B. C. 102.....	Gaul.....	Romans; Teutons.....	Cæsar Marius annihilates the barbarian army.
Arbola ( <i>ar-bol'-a</i> ).....	B. C. 331.....	Peria.....	Macedonians; Persians.....	This victory made Alexander master of Asia.
Arvola ( <i>ar-bol'-a</i> ).....	1790, Nov. 15-17.....	Italy.....	French under Napoleon; Austrians.....	Napoleon prevented the junction of two Austrian armies.
Arrot ( <i>ar-rot</i> ), Siege of.....	1751, Aug. 31-Nov. 15.....	India.....	English and Sepoys; French.....	Robert Clive held out ten weeks against a far superior force before being relieved.
Arguin ( <i>ar-guin</i> ).....	B. C. 406.....	Asia Minor.....	Athenians; Peloponnesians.....	Command of the sea temporarily restored to the Romans.
Arma ( <i>ar-ma</i> ).....	1588, July.....	English Channel.....	English; Spanish.....	Beginning of English sea-power.
Arzur ( <i>ar-zur</i> ).....	1191, Sept. 7.....	Syria.....	English Crusaders; Saracens.....	Great victory of Richard the Lion Hearted over Saladin.

† Naval battles; \* Indecisive; ★ Numbers after names of battles refer to wars so numbered under Notable Wars of History, p. 193.

## NOTABLE BATTLES OF UNIVERSAL HISTORY—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMBATANTS	REMARKS
†Artemisium (ar-te-mish'-um).....	B. C. 480.....	Euboea.....	*Persians; Greeks.....	Fought at the same time as the battle of Thermopylae.
Ascalon (as'-ka-lon).....	1099.....	Syria.....	Crusaders; Saracens.....	Modern resistance to Christians ended for a time.
Asculum (as'-ku-lum).....	B. C. 279.....	Italy.....	Pyrrius; Romans.....	Pyrrius, though victorious, suffered greatly.
Aspern (as'-pern).....	1809, May 21-22.....	Austria.....	*Austrians; French.....	Napoleon retired. Each side lost about 20,000 men.
Assaye (a-si).....	1803, Sept. 23.....	India.....	English; East Indians.....	Sir Arthur Wellesley (later duke of Wellington) defeated forces almost ten times as numerous.
Austerlitz (ous'-ter-litz).....	1805, Dec. 2.....	Austria.....	French; Russians, Austrians.....	The Battle of the Three Emperors: Napoleon, Alexander I, Francis I.
†Azores (a-zo-ras).....	1591.....	Atlantic.....	Spanish; English.....	Gallant fight made by Sir Richard Grenville in the <i>Mercury</i> .
Balaclava (bal-a-kla'-va).....	1854, Oct. 25.....	Crimea.....	Russians; English.....	"Charge of the Light Brigade" celebrated by Tennyson.
Bannockburn (ban'-ok-burn).....	1314, June 24.....	Scotland.....	Scots; English.....	Bruce drove back English invaders with great slaughter.
Barnet (bar'-net).....	1471, Apr. 4.....	England.....	Yorkists; Lancastrians.....	Earl of Warwick ("Kingmaker") slain.
Bantzen (ban'-zen).....	1813, May 20-31.....	Germany.....	French; Prussians, Russians.....	The allies lost 15,000 killed and wounded.
†Beauchamp (bo'-cham).....	1690, June 30.....	England.....	French; English, Dutch.....	The French had been sent to create a diversion in favor of James II. in Ireland.
Belgrade (bel'-grid'), Siege of.....	1456, April.....	Serbia.....	Hungarians; Turks.....	John Hunyadi's last exploit.
Beneventum (ben-e'-ven-um).....	B. C. 275.....	Italy.....	Romans; Pyrrhus.....	Pyrrhus' last serious attack against the Romans.
Berezina (ber-eg'-a-sin).....	1812, Nov. 28.....	Russia.....	Russians; French.....	A most terrible disaster on the retreat from Moscow.
Bergen-op-Zoom (ber-eg'-on-op-zoom'), Siege of.....	1747.....	Netherlands.....	French; English, Dutch.....	French lost heavily in the siege.
Bibracte (bi-brak'-te).....	B. C. 58.....	Gaul.....	Romans; Helvetians.....	A defeat would have meant destruction to Cæsar.
Blenheim (blen'-im).....	1704, Aug. 13.....	Bavaria.....	British, Imperialists; French, Bavarians.....	Brilliant victory of Marlborough and Prince Eugene.
Borodino (bor-o-dy'-no), com-monly Anglicized, bor-bé'-no).....	1812, Sept.....	Russia.....	*French; Russians.....	One of the most bloody battles on record.
Bosworth Field.....	1485, Aug.....	England.....	Lancastrians; Yorkists.....	Richard III. slain; Henry Tudor becomes Henry VII. of England.
Bouvines (bo'-vin).....	1214.....	Flanders.....	French; Flemish, English, Germans.....	Secured the position of Philip Augustus on the throne of France.
Bovianum (bo-vi'-num), Siege of.....	B. C. 305.....	Italy.....	Romans; Samnites.....	End of second Samnite war.
Boyle (boi), river.....	1690, July 1.....	Ireland.....	William III.; James II.....	Irish under James II. totally defeated.
Brettenfeld (bri'-en-feld).....	1631, Sept. 7.....	Germany.....	Swedes, Saxons; Imperialists.....	Brilliant victory of Gustavus Adolphus over Tilly.
Brettenfeld.....	1642.....	Germany.....	Swedes; Imperialists.....	Victory of Turenne over Piccolomini.
Brill, Capture of.....	1572.....	Holland.....	Netherlanders; Spanish.....	The first success of the Netherlanders.
Buena Vista (bo'-na-vis-ta), Battle of.....	1847, Feb. 22-23.....	Mexico.....	Americans; Mexicans.....	General Zachary Taylor victorious over much larger force.
Bull Run.....	1861, July 21.....	Virginia, U. S. A.....	Confederates; Federals.....	The first important battle of the Civil war.
Bunker's Hill.....	1773, June 17.....	Mass., U. S. A.....	British; Americans.....	Though dislodged from their position, the British won a practical victory.
Byzantium (bi-zan'-ti-um), Siege of.....	1453, July 17.....	Thrace.....	Constantines; Lelinius.....	Byzantium re-founded as Constantinople, the capital of the empire.
†Cadix (ka'-dis, Sp. ka'-dik).....	1587.....	Spain.....	English; Spanish.....	Here Drake "singd the King of Spain's beard."
Calais (Fr. ka'-la) Siege of.....	1346-1347.....	France.....	English; French.....	Calais remained in English possession until 1558.
†Camperdown (kam-per-down).....	1797, Oct. 11.....	Holland.....	British; Dutch.....	The Dutch fleet, allied with France, was practically destroyed.
Cannæ (kan'-e).....	B. C. 216.....	Italy.....	Carthaginians; Romans.....	Hannibal inflicts one of the most disastrous defeats the Romans ever suffered.
†Cape St. Vincent.....	1797, Feb. 14.....	Portugal.....	British; Spanish.....	Spanish fleet, allied with France, beaten by Admiral Jervis.
Capua (kap'-u-a, It. ka'-pu-a), Siege of.....	B. C. 211.....	Italy.....	Romans; Capuans and Carthaginians.....	Hannibal was unable to break through Roman lines and relieve the city.
Carrhae (kar'-e).....	B. C. 53.....	Mesopotamia.....	Parthians; Romans.....	Cressa, one of the triumvirs, defeated and shortly after slain.
Carthage (kar'-thaj), Siege of.....	B. C. 146.....	N. Africa.....	Romans; Carthaginians.....	Carthage ruined to the ground.
Castillon (ka'-sti-yon).....	1453, July 17.....	France.....	French; English.....	This victory ended the Hundred Years' war.
†Catana (ka'-da-na).....	B. C. 287.....	Sicily.....	Carthaginians; Syracusans.....	Syracusans utterly routed. Carthaginians besieged Syracuse.
Caudine (ka'-din) Forks.....	B. C. 321.....	Italy.....	Samnites; Romans.....	The whole Roman army was "sent under the yoke."
Cawnpore (kan'-por).....	1857, Dec. 6.....	India.....	British; Mutineers.....	Sir Colin Campbell routed mutineers.
Cheronæa (ker-ba'-na).....	B. C. 338.....	Greece.....	Macedonians; Athenians and Thebans.....	Philip of Macedon wins hegemony of Greece.
Chalons (sha'-lon).....	451.....	France.....	Romans and Visigoths; Huns.....	Attila retreated and western Europe was saved from the Huns.
Chattanooga (cha-ta'-na-ga).....	1863, Nov. 24-27.....	Georgia, U. S. A.....	Federals; Confederates.....	The "Battle above the Clouds" fought on Lookout Mountain.
Chickamauga (chik-a-ma-ga).....	1863, Sept. 19-20.....	Tenn., U. S. A.....	Confederates; Federals.....	Federal losses 16,000; Confederate about 12,000.
Chiosgia (chi-og'-ia), Blockade of.....	1380, Jan.-June.....	Venetia.....	Venetians; Genoese.....	Loss of this city broke the power of the Genoese republic for many years.
Chotusitz (cho'-tus-it).....	1742, May 17.....	Bohemia.....	Prussians; Austrians.....	This victory led Austria to sign the peace of Breslau, June 11, 1742.
Clusium (hi'-shi-um).....	B. C. 275.....	Italy.....	Gauls; Romans.....	Romans said to have lost 25,000.
†Cnidus (ni'-du).....	B. C. 394.....	Asia Minor.....	Athenians and Persians; Spartans.....	Sparta lost her recently gained maritime ascendancy.
Colenso (ka'-len-so).....	1899, Dec. 15.....	S. Africa.....	Boers; British.....	First action in Buller's campaign for the relief of Ladysmith.
†Constantinople (kon-stanti-nop'-le), Siege of.....	B. C. 52.....	Rome.....	Optimates; Democrats and Samnites.....	Sulla's victory ended the Roman civil war.
†Constantinople (kon-stanti-nop'-le), Siege of.....	1204.....	Thrace.....	Crusaders and Venetians; Greek empire.....	Baldwin of Flanders becomes Latin emperor of the East.

## NOTABLE BATTLES OF UNIVERSAL HISTORY—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	CONTESTANTS	REMARKS
Constantinople, Siege of . . . 24	1453, Apr. 6-May 29	Thrace . . . . .	Turks; Greeks . . . . .	Final overthrow of Greek empire.
Copenhagen (kō-pen-hēn) Bombardment of . . . 56	1807 . . . . .	Denmark . . . . .	British; Danish . . . . .	English forces surrender of Danish fleet to save it to Napoleon.
Corunna (kō-run'd) . . . . . 56	B. C. 394 . . . . .	Greece . . . . .	Spain; Thess, Corinth, Argos and Athens . . . . .	Agamemnon, Spartan king compelled to evacuate Boeotia.
Corrá (kōr-á) . . . . . 56	1809, Jan. 16 . . . . .	Spain . . . . .	British; French . . . . .	French kept at bay while British embarked.
Courtrai (kōr-trá) . . . . . 39	1302, July 11 . . . . .	Flanders . . . . .	Flemish; French . . . . .	"Battle of the Spurs"; Great carnage among French knights.
Cristina (kris-mēn), the river . . . . . 39	1346, Aug. 26 . . . . .	France . . . . .	English; French . . . . .	Victory due to English archers.
Culloden (kū-lō-den or -lō-dēn) . . . . . 56	B. C. 340 . . . . .	Sicily . . . . .	Sicilians; Carthaginians . . . . .	Secured Greek towns of Sicily peace for many years.
Cunata (kū-nak'at) . . . . . 24	1746, Apr. 16 . . . . .	Scotland . . . . .	British; Scots under Young Pretender . . . . .	Last attempt of the Stuarts to recover British throne.
Cutossa (kū-dō'at) . . . . . 65	B. C. 401 . . . . .	Babylonia . . . . .	Cyrus and the "Ten Thousand"; Persians . . . . .	Cyrus was slain and the Greeks made the "Anahitis" to the sea.
Cyaneophalus (kū-nē-ōf'ul' a-dē or an-dē) . . . 16	1866, June 24 . . . . .	Italy . . . . .	Austrians; Italians . . . . .	Though defeated the Italians gained Venetia through Frusis.
Cydicus (kū-dē-kus) . . . . . 7	B. C. 197 . . . . .	Greece . . . . .	Romans; Macedonians . . . . .	Philip V. forced to abandon the hegemony of Greece.
Delhi (dē'lī), Siege of . . . . . 61	B. C. 410 . . . . .	Protopolis . . . . .	Athenians; Peloponnesians . . . . .	Athenians surprised and practically annihilated the Peloponnesian fleet.
Delhi (dē'lī), Siege of . . . . . 61	1857, June 8-Sept. 20 . . . . .	India . . . . .	British; Mutineers . . . . .	Delhi was the real center of the Indian mutiny.
Dellus (dē'lūm) . . . . . 7	B. C. 424 . . . . .	Greece . . . . .	Boeotians; Athenians . . . . .	Decisive and disastrous defeat for Athenians.
Dennawitz (dēn-naw'it) . . . . . 56	1813, Sept. 6 . . . . .	Germany . . . . .	Russians; Prussians and Swedes, Allies French . . . . .	Victory of Bernadotte (afterward Charles XIV. of Sweden) over Ney.
Deorham (de-or'hām) . . . . . 29	877 . . . . .	England . . . . .	West Saxons; Welsh . . . . .	Wessex extended to Bristol channel, severing Welsh into two parts.
Dessau (dē-sau) . . . . . 47	1626 . . . . .	Germany . . . . .	Imperialists; Protestants . . . . .	Wallenstein totally routed Mansfeld.
Dettingen (dē'ting-en) . . . . . 63	1743, June 27 . . . . .	Germany . . . . .	British; French . . . . .	Last battle in which a British sovereign engaged in person.
Donro (dō'rō), Span. dō'rō) the river . . . . . 56	1809, May 12 . . . . .	Portugal . . . . .	British; French . . . . .	French driven out of Oporto.
Downs, The . . . . . 16	1666, June 11-14 . . . . .	North Sea . . . . .	Dutch; English . . . . .	English fleet took shelter in the Thames; Dutch too crippled to pursue.
Drepans (drep'a-n) . . . . . 14	B. C. 249 . . . . .	Sicily . . . . .	Carthaginians; Romans . . . . .	This and other defeats led Romans to abandon the sea temporarily.
Dresden (dres'dēn), Ger. dres'dēn . . . . . 56	1813, Aug. 26, 27 . . . . .	Germany . . . . .	French; Russians, Prussians and Austrians . . . . .	Napoleon's last great victory on German soil.
Drogheda (drō'hē-dā or drō'ē-dā), Storm of . . . . . 48	1649, Sept. 12 . . . . .	Ireland . . . . .	British; Parliamentarians; Royalists . . . . .	Cromwell put the garrison to the sword.
Dunbar (dun-bār) . . . . . 48	1650, Sept. 3 . . . . .	Scotland . . . . .	Parliamentarians; Scottish Royalists . . . . .	Cromwell's victory followed by the surrender of Edinburgh and Glasgow.
Ebersberg (a'ber-berg), Storm of . . . . . 56	1809, May 3 . . . . .	Bohemia . . . . .	French; Austrians . . . . .	A heroic combat in which thousands were burned in the ruined village.
Ecnomus (ek'nō-mus) . . . . . 14	B. C. 256 . . . . .	Sicily . . . . .	Romans; Carthaginians . . . . .	Romans laid waste Carthaginian territory in Africa.
Edgell . . . . . 48	1642, Oct. 23 . . . . .	England . . . . .	Royalists; Parliamentarians . . . . .	The first battle of the Civil war. Royalists march on London.
El Caney (el kē-nē) . . . . . 56	1898, July 1 . . . . .	Cuba . . . . .	Americans; Spaniards . . . . .	The third battle of the war in Cuba.
Elindam (el'indōn) . . . . . 33	823 . . . . .	England . . . . .	West Saxons; Mercians . . . . .	The West Saxons expelled the Mercians from all the English.
Elvisham (el'ishām) . . . . . 38	1265, Aug. 4 . . . . .	England . . . . .	Princes Edward; Simon de Montfort . . . . .	This defeat ended the war. Simon de Montfort fell.
Eylau (ē'lau) . . . . . 56	1807, Feb. 8 . . . . .	Prussia . . . . .	Russians and Prussians; French . . . . .	The bloodiest and most desperate battle of a century.
Falkirk (fāl'kirk), Scot. fō'kirk) . . . . . 56	1298, July 22 . . . . .	Scotland . . . . .	English; Scotch . . . . .	Edward I. utterly routed Wallace.
Fehrbellin (fēr-bel-lin) . . . . . 56	1675, June 18 . . . . .	Brandenburg . . . . .	Brandenburgers; Swedes . . . . .	The first great victory of Brandenburg, Prussia.
Floeden (fōd'n) . . . . . 56	1513, Sept. 9 . . . . .	England . . . . .	English; Scots . . . . .	The Scottish king perished, with the bravest of his nobility.
Fontenoy (fōn-dōn-ō) . . . . . 56	1745, June 30 . . . . .	France . . . . .	Louis and Charles; Lothar (Grandson of Charles V.) . . . . .	Followed by the famous Partition of Verdun (1843).
Fontenoy (fōn-dōn-ō) . . . . . 56	1745, May 11 . . . . .	Belgium . . . . .	French; British, Dutch and Austrians . . . . .	Last great victory of France under the Old Regime.
Fornovo (fōr-nōvō) . . . . . 56	1495, July 6 . . . . .	Italy . . . . .	French; Italians . . . . .	Charles VIII. enabled to continue his retreat following his conquest of Naples.
Friedland (fryl'and or fryl'and) . . . . . 56	1807, June 14 . . . . .	Prussia . . . . .	French; Russians . . . . .	This defeat induced the Czar to conclude the peace of Tilsit.
Gibraltar (gib'rālar), Siege of . . . . . 54	1704-82 . . . . .	Spain . . . . .	British; French and Spanish . . . . .	Lee from northern aid.
Gibraltar (gib'rālar), Siege of . . . . . 54	1492, Jan. 2 . . . . .	Spain . . . . .	Spaniards; Moors . . . . .	The last formidable attack upon Gibraltar.
Grausau (grā-sau), Capture of . . . . . 12	B. C. 334 . . . . .	Asia Minor . . . . .	Alexander the Great; Persians and Greek Mercenaries . . . . .	Completes the overthrow of the Moorish power in Spain.
Granson (grā-sōn) . . . . . 56	1476, Mar. 2 . . . . .	Switzerland . . . . .	Swiss; Burgundians . . . . .	Duynard the only army opposed to Alexander in Asia Minor.
Gravelotte (grā-vēlōt) . . . . . 56	1870, Aug. 18 . . . . .	Lorraine . . . . .	Prussians; French . . . . .	First of the three great victories of the Swiss over Charles the Bold.
Guinegate (gūn-gēgāt) . . . . . 56	1513, Aug. 16 . . . . .	France . . . . .	English and Imperialists; French . . . . .	The first great victory of the Prussians in the war.
Haarlem (hār-lēm), Siege of . . . . . 46	1672-3, Dec. 9-July 17 . . . . .	Holland . . . . .	Spaniards; Dutch . . . . .	Called the "Battle of the Spurs" from the French haste in flight.
Halidon (hal'īdōn) hill . . . . . 56	1333, July 19 . . . . .	England . . . . .	Edward III. of England; Scots . . . . .	30,000 Spaniards against 4,000 Dutch; 2,000 Dutch assailed.
Hampton (hamp'ton) roads . . . . . 63	1862, March 8 . . . . .	England . . . . .	Union; Confederate . . . . .	Won by combination of archers and dismounted cavalry.
Hasenbeck . . . . . 53	1757, July 26 . . . . .	Germany . . . . .	French; Hanoverians . . . . .	Followed by the conversion of Closter-Zeven, which George II. repudiated.
Hastings (hās'tingz) . . . . . 35	1066, Oct. 14 . . . . .	England . . . . .	Normans; English . . . . .	Harold fell; William the Conqueror became king of England.
Heraclea (hēr-aklē-ā) . . . . . 13	B. C. 280 . . . . .	Italy . . . . .	King Pyrrhus; Romans . . . . .	"One more such victory and I shall be ruined," Pyrrhus.
Hertham (hēr'tham) . . . . . 42	1464, May 15 . . . . .	England . . . . .	Yorkists; Lancastrians . . . . .	The Lancastrian cause was completely crushed by this defeat.
Himera (hīm-ēr-ā) . . . . . 24	B. C. 480 . . . . .	Sicily . . . . .	Syracusan and Agrigantum; Carthaginians . . . . .	Hamular slain. Carthaginians purchased peace for 2,000 talents.

## NOTABLE BATTLES OF UNIVERSAL HISTORY—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	CONTESTANTS	REMARKS
Himera, Siege of.....	B. C. 409.....	Sicily.....	Carthaginians; Sicilian Greeks.....	Town sacked and prisoners sacrificed to the shade of Hamilcar.
Höchst, (Höde).....	1622, June 20.....	Germany.....	Imperialists; Palatinate troops.....	Henry IV. ends Bohemian-Palatinate phase of the Thirty Years' war.
Hohenfriedburg (hö-fri-d'burg).....	1745, June.....	Germany.....	Prussians; Austrians and Saxons.....	One of Frederick the Great's victories; due to Frederick to Austrian consideration.
Hohenlinden (hö-en-lin-d'en).....	1800, Dec. 3.....	Bavaria.....	French; Austrians.....	The crowning event of the winter campaign; won by Moreau.
Hohenkirchen (hö-kirch-en).....	1758, Oct. 14.....	Germany.....	Austrians; Prussians.....	Frederick the Great, though surprised by a night attack, made good his retreat.
Hornblenden (horn-bl'en) hill.....	1402, Sept. 14.....	England.....	English; Scots.....	Another great victory due to the prowess of the English longbowmen.
Hydaspes (hi-das-p'es) river.....	B. C. 326.....	India.....	Greeks; Asiatics.....	The last important battle in the eastward advance of Alexander the Great.
Invermarnock (in-ver-marn'ok).....	1854, Nov. 8.....	Crimes.....	British and French; Russian.....	A series of hand-to-hand combats fought in a dense fog.
Inverlochry (in-ver-loch'ry).....	1645, Feb. 2.....	Scotland.....	Royalist Highlanders; Campbells and Lowland Covenanters.....	Power of the Campbells in the Highlands broken for many years.
Ipsus (ip'us).....	B. C. 301.....	Asia Minor.....	Seleucus; Antigonus.....	Chief battle between Alexander's generals over the partition of his empire.
Iusus (i'u-sus).....	B. C. 333.....	Macedonia; Asia Minor.....	Macedonians; Asiatics.....	Alexander's brilliant victory over an immense horde of Persians.
Ivry (iv'ry).....	1590, March 14.....	France.....	Huguenots; Catholics.....	Henry IV. gained a complete victory and loved Paris, his capital.
Jarnac (jarn'ak).....	1569, March 13.....	France.....	Catholics; Huguenots.....	Prince de Condé slain.
Jemmapes (jem-map'es).....	1792, Nov. 6.....	Belgium.....	French; Austrians.....	Followed by annexation of the Austrian Netherlands to France.
Jena (je'na).....	1806, Oct. 14.....	Germany.....	French; Prussians.....	Napoleon advanced thence to Berlin and issued the decree for a continental blockade.
Jerusalem (je-rü-s'ed-lem), Siege of.....	1099, July 15.....	Syria.....	Jews; Romans.....	Titus destroyed the city and massacred or sold into slavery its inhabitants.
Jerusalem, Storm of.....	1521, Oct. 11.....	Syria.....	Crusaders; Moslems.....	A terrible massacre; feudal kingdom established Catholic Cantons; Zurichers.
Kappel (kapp'pel).....	1877, Nov. 17-18.....	Switzerland.....	Zwingli, the Swiss Protestant reformer, fell in this battle.	Russian success caused angry negotiations between England and Russia.
Kars (kars), Storm of.....	1813, Aug. 26.....	Armenia.....	Prussians; French.....	A decisive victory of Blücher over one of Napoleon's marshals.
Katzbach (katz'bach).....	1854-5, Mar. 12-13.....	Germany.....	Mahdi; Gordon.....	"Chinese" Gordon killed; the Sudan evacuated by the Anglo-Egyptian government.
Killicrankie (kil-l'cran'ki).....	1689, July 17.....	Soudan.....	Highland Jacobites; Royalists.....	The Jacobite victory was nullified by the fall of their leader, Dundee.
Kimberley (kim-ber-ly), Siege of.....	1899-1900, Oct. 15-Feb. 15.....	S. Africa.....	British; Boers.....	The brilliant defense of Kimberley was a notable feature of the war.
Kin-chau (kin-cheu').....	1904, May 26.....	Manchuria.....	Japanese; Russians.....	General Oku opened the way for the land investment of the Japanese.
Koniggratz (kón'ich-grátz').....	1866, July 3.....	Germany.....	Prussians; Austrians.....	This victory gave the supremacy to Germany in Prussia.
Kolin (kol'in).....	1757, June 18.....	Bohemia.....	Austrians; Prussians.....	Following this defeat, Frederick the Great evacuated Bohemia.
Kosova (kos'o-s).....	1389, June 15.....	Servia.....	Turks; Christian Slavs.....	A battle famed in the history, legend and literature of Servia.
Kosovo.....	1448, Oct. 17-19.....	Servia.....	Turks; Christians.....	The hero, John Hunyadi, overcame at the head of 40,000 Turks his rival, John Szekesi, by sheer personal ascendancy.
Kottin (cho-dem').....	1787, Nov. 11.....	Russia.....	Polas; Turks.....	stems tide of Turkish advance.
Kulm (kol'm).....	1813, Aug. 29-30.....	Germany.....	Austrians, Russians and Prussians; Napoleon.....	7,000 French capitulated; "The Cauldron of modern war." Conducted to the defeat at Leipzig.
Kunersdorf (kún'ner-dorf).....	1759, Aug. 12.....	Germany.....	Austrians and Russians; Prussians.....	Insincerity of the allies saved Frederick the Great from annihilation.
Lade (lä'de).....	B. C. 494.....	Asia Minor.....	Persians; Ionian Greeks.....	This defeat put an end to the Ionian revolt.
Lady Smith (lä'di-smith).....	1899-1900, Nov. 2-Feb. 28.....	S. Africa.....	British; Boers.....	Like the siege of Kimberley, a notable incident of the war.
La Hogue (la hóg).....	1692, May 10-20.....	N. W. France.....	English and Dutch; French.....	Overthrew the hopes of James II. of recovering his throne.
Lake Erie.....	1813, Sept. 10.....	Lake Erie.....	Americans; British.....	"We have met the enemy and they are ours."—Perry.
La Rochelle (la ro-shel').....	1372, June 22-23.....	France.....	French and Spaniards; English.....	Continued of the pauses for a time to the side of the French.
La Rochelle, Siege of.....	1627-8, Nov. 1-Oct. 28.....	France.....	Richelieu; Huguenots and English.....	Huguenots no longer an armed political party but a tolerated sect.
Lechfeld (lech'feld).....	955, Aug. 10.....	Germany.....	Otto I.; Hungarians.....	A crushing defeat inflicted on the waning power of the Hungarians.
Lech (lech), the river.....	1632, April 15.....	Germany.....	Gustavus Adolphus; German Catholic League.....	Tilly mortally wounded.
Legnano (lem-yán'o).....	1176, May 29.....	Italy.....	Lombard League; Frederick Barbarossa.....	In the peace of Konstanz (1183), Frederick renounced all royal privileges over the cities.
Leipzig (leip'zig).....	1631, Sept. 17.....	Saxony.....	Swedes and Saxons; Catholic Imperialists.....	Brilliant victory of Gustavus Adolphus saves Protestant cause.
Leipzig.....	1813, Oct. 16, 18-19.....	Saxony.....	Allies; Napoleon.....	This disaster left Germany to Napoleon.
Le Mans (le mon').....	1871, Jan. 6-12.....	France.....	Prussians; French.....	French army almost annihilated.
Lepanto (le-pán'to).....	1571, Oct. 7.....	Gulf of Corinth.....	Don John of Austria; Turks.....	One of the most splendid naval victories ever achieved.
Leuctra (lek'tra).....	B. C. 371.....	Greece.....	Thebans; Spartans.....	Epaminondas' overthrow of Sparta gives to Thebes the hegemony in Greece.
Leuthen (loot'en).....	1757, Dec. 5.....	Germany.....	Prussians; Austrians.....	This battle "would alone make Frederick immortal and rank him among the greatest generals."—Napoleon.
Lewes (lü'e).....	1264, May 14.....	England.....	Simon de Montfort; Henry III. and Prince Edward.....	Simon de Montfort's victory followed by Parliament, the first to which borough representatives were called (1265).
Leyden (lü'den), Siege of.....	1574, May 20-Oct. 3.....	Holland.....	Dutch; Spaniards.....	Prince of Orange put the dike to bring the city to the mercy of the Spaniards.
Lignitz (lit'ni-tz).....	1760, Aug. 16.....	Germany.....	Prussians; Austrians.....	Frederick prevented the union of the Austrians and Russians.
Ligny (lü-ni-yé).....	1815, June 16.....	Belgium.....	Napoleon; Blücher.....	Napoleon's last victory; Blücher joined Wellington at Waterloo on the 18th.

## NOTABLE BATTLES OF UNIVERSAL HISTORY—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	CONTENTENTS	REMARKS
Lille (lîl'), Siege of.....50	1708, Aug. 12-Oct. 22	France.....	Imperialists; French.....	France now lay open to the advance of the allies.
Lilybæum (lîl'-bæ'-um), Siege of.....14	B. C. 250-241.....	Sicily.....	Carthaginians; Romans.....	One of most protracted sieges in history; surrendered only with Sicily at close of war.
Linköping (lîn'-chô'-pîng).....	1598, Sept. 25.....	Sweden.....	Swedes; Poles under King Sigismund.....	Led to perpetual hostility between Sweden and Poland in seventeenth century.
Lissa (lîs'-a).....65	1866, July 20.....	Adriatic.....	Austrians; Italians.....	The only battle between ironclads fought in European waters.
Lobositz (lô'-bô'-sîz).....53	1756, Oct. 1.....	Bohemia.....	*Prussians; Austrians.....	18,000 Saxons besieged at Pirna were now forced into the French army.
Lodi (lô'-dô'), Bridge of.....66	1796, May 10.....	Italy.....	Napoleon Bonaparte; Austrians.....	This success gave the whole of Lombardy to the French.
Logan-Fourry (lô'-gan'-fô'-ry).....55	1860, Dec. 2.....	France.....	Prussians; French.....	Prevented the French from relieving Orizaba.
Louisburg (lô'-bûr'-g), Siege of.....53	1758, June 8-July 27	Canada.....	British; French.....	Destruction of one of the strongest fortresses in America.
Lutetia (lû'-tê'-a).....61	1857-58, July 1-Mar. 19	India.....	British; Sepoy mutineers.....	The turning of the tide; next year the mutiny was totally quelled.
Lutter (lû'-têr).....47	1626, Aug. 26.....	Germany.....	Catholics and Imperialists; Danes and Protestant Germans.....	Christian of Denmark, severely defeated, retires into Holstein and Mecklenburg.
Lützen (lû'-tsem).....47	1632, Nov. 16.....	Saxony.....	Swedes and Protestant Germans; Catholics and Imperialists.....	Gustavus Adolphus slain in winning his third great victory.
Lützen.....56	1813, May 2.....	Saxony.....	Napoleon; Allies.....	The first battle in the great German War of Liberation.
Luzzara (lû'-zâ'-râ).....50	1702, Aug. 15.....	Italy.....	*French; Imperialists.....	Followed by French ascendancy in Italy until 1706.
Macle (mâ'-kê).....53	1427, Oct. 11.....	Italy.....	Venice; Milan.....	Carnegie gained a brilliant victory over the famous condottieri, Spors, Piccinino, and Malatesta.
Madrâs (mâ'-drâs), Siege of.....53	1758-59, Dec. 12-Feb. 16.....	India.....	English; French.....	Failure to take Madras was a great blow to French power in India.
Maestricht (mâ'-trîch), Siege of.....46	1579, Mar. 13-June 29	Belgium.....	Spaniards; Dutch.....	Inhabitants and garrison massacred.
Maifeking (mâ'-fê'-king), Siege of.....70	1899-1900, Oct.-May 17.....	S. Africa.....	British; Boers.....	Boers' resistance aroused world-wide enthusiasm.
Magdeburg (mâ'-gê'-bûr'-g), Siege of.....47	1631, May 20.....	Germany.....	Catholics and Imperialists; Protestants.....	The sack of Magdeburg is one of the darkest spots on the pages of history.
Magenta (mâ'-jên'-tâ).....	1859, June 4.....	Italy.....	French and Piedmontese; Austrians.....	Napoleon III. and Victor Emmanuel entered Milan.
Magnesia (mâ'-jên'-tâ).....	B. C. 190.....	Asia Minor.....	Romans; Antiochus the Great.....	The kingdom of the Seleucids dismembered.
Malaga (mâ'-lâ'-gâ).....50	1487, May 8-Aug. 15	Spain.....	Spaniards; Moors.....	The inhabitants were sold into slavery.
Malakoff (mâ'-lâ'-kôf), Siege of.....60	1704, Aug. 24.....	Spain.....	English and Dutch; French.....	French fleet prevented from uniting with French power in India.
Malakoff (mâ'-lâ'-kôf), Siege of.....60	1855, Sept. 8.....	Crimia.....	French; Russians.....	Loss of this and other earthworks led that night to the evacuation of Sebastopol.
Mal-Jaroslavl (mâ'-jâ'-rô'-slâv).....56	1812, Oct. 24.....	Russia.....	*Russians; French.....	Napoleon was forced to abandon southerly line of retreat from Moscow.
Malplaquet (mâ'-plâ'-kê).....50	1709, Sept. 11.....	France.....	British and Imperialists; French.....	Blindfold battle of this war; "carnage, not a Admiral Duguay-Trouin destroyed the Spanish fleet."
Manila (mâ'-ni'-lâ).....59	1908, May 1.....	Philippines.....	Americans; Spaniards.....	The last of the great pitched battles of the crusades. Shortly after Louis IX. was captured and ruinously ransomed.
Mansurah (mân'-sûr'-â).....36	1250, April 8.....	Egypt.....	*French Crusaders; Saracens.....	The Spartans regained their supremacy in Peloponnesus.
Mantinea (mân'-tê'-nâ).....7	B. C. 418.....	Greece.....	Spartans; Athenians and Argives.....	The death of Epaminondas in this battle ends Theban supremacy.
Mantinea.....32	B. C. 352.....	Greece.....	Thebans; Spartans.....	The close of Napoleon's marvelous first Italian campaign.
Marston (mâr'-stôn).....55	1706-7, June-Feb. 2.....	Italy.....	French; Austrians.....	Miltiades' victory causes Persians to abandon their first expedition against Greece.
Marathon (mâr'-dâ-thôn).....5	B. C. 490.....	Greece.....	Athenians and Plataeans; Persians.....	Licinius lost all his European territory except Thrace.
Mardia (mâr'-di'-â).....28	315.....	Thrace.....	Licinius; Constantine the Great.....	Won for Napoleon largely by General Lenoir.
Marengo (mâr'-rên'-gô).....65	1800, June 14.....	Italy.....	French; Austrians.....	France I. reconquered Milan by this brilliant victory.
Marignano (mâr'-rî-nâ'-gô).....49	1515, Sept. 13, 14.....	Italy.....	French; Swiss.....	French infantry with bayonets charged the cavalry, a new maneuver.
Marsaglia (mâr'-sâ'-lâ).....48	1693, Oct. 4.....	Italy.....	Parliamentarians; Royalists.....	This victory due to Cromwell's Ironsides gave the north to parliament.
Marton Moor.....45	1644, July 2.....	England.....	Mercians; Northumbrians.....	Mercia becomes a competitor with Northumbria for English hegemony.
Marsfield (mâr'-sê'-fîld).....32	1642.....	England.....	Mercians; Northumbrians.....	The capitulation of Finck with 12,000 Prussian soldiers, disastrous to Frederick.
Mazen (mâ'-zên).....53	1759, Nov. 20.....	Germany.....	Austrians; Prussians.....	Established the independence of Cullin.
Mayno (mâ'-nô).....56	1818, April 8.....	Chill.....	Chillians; Spaniards.....	Spaniards mercilessly sabred in the pursuit, losing 15,000.
Medellin (mê'-dêl'-ên).....56	1809, March 28.....	Spain.....	French; Spaniards.....	Antipater, in absence of Alexander, puts down revolted Spartans in a bloody battle.
Megapolis (mê'-gô'-pô'-lîs).....	B. C. 231.....	Greece.....	Macedonians; Spartans.....	Geribadians routed after defeating papal forces.
Mentana (mên'-tâ'-nâ).....	1867, Nov. 3.....	Italy.....	Garibaldians; French and Papal troops.....	Charles of Anjou evacuated Sicily, which his descendants never recovered.
Messina (mê'-sê'-nâ).....	1282, Sept. 28.....	Sicily.....	Sicilians and Aragonese; French.....	The release of the besieging army for service elsewhere was fatal to the French cause.
Metaxa (mê'-tâ'-xâ).....15	B. C. 207.....	Italy.....	Romans; Carthaginians.....	This completes the expulsion of the Neapolitans from Sicily.
Metz (mêz), Siege of.....27	1793, Aug. 19-Oct. 27.....	Lorraine.....	Prussians; French.....	The French were decisively beaten and driven from Metz.
Mifano (mî'-fâ'-nô).....62	1860, July 20.....	Sicily.....	Garibaldians; Neapolitans.....	Practically ended the war of the Pacific (1879-1884) between Chile and Bolivia and Peru.
Minden (mî'-nên).....53	1790, Aug. 1.....	Prussia.....	English, Hessians and Hanoverians; French.....	Greek heroism excited sympathy throughout Europe (Byron died here, 1824).
Miraflores (mî'-râ'-fô'-rêz).....	1883, Jan. 13 and 15	Argentina.....	Chillians; Peruvians.....	Prisoners killed, walls pulled down, fleet fortified, annual tribute imposed.
Mitsushima (mî'-tî'-shûm), Siege of.....58	1825-26, April 27-April 22, 23.....	Greece.....	Turks; Greeks.....	Lord Methuen drives Cronje from his intrenchments after a fierce fight.
Mitylene (mî'-tî'-lê-nê), Siege of.....7	B. C. 428-427.....	Lesbos.....	Athenians; revolted inhabitants.....	
Modder (môd'-êr) River.....70	1899, Nov. 28.....	S. Africa.....	British; Boers.....	

## NOTABLE BATTLES OF UNIVERSAL HISTORY—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	CONTESTANTS	REMARKS
Mohacs (moh'ach).....34	1526, Aug. 29.....	Hungary.....	Turks; Hungarians.....	"Never was a single battle so disastrous to a people."
Mollwitz (mol'vitz).....52	1741, April 10.....	Germany.....	Prussians; Austrians.....	Frederick's victory forces Europe to recognize in Prussia a new power.
Montaperti (mon-ta-per'te).....	1260, Sept. 4.....	Italy.....	Florentine Ghibellines, Siennese; Guelphs of Florence.....	Secured the triumph of the Ghibellines over all Tuscany.
Monterey (mon-te-ré).....59	1846, Sept. 21-23.....	Mexico.....	Americans; Mexicans.....	Followed by the occupation of the whole of northern Mexico.
Montreal (mont-ri-dé).....53	1760, Sept. 8.....	Canada.....	British; French.....	Completes the British conquest of Canada from France.
Moock (mook).....46	1570, April 14.....	Holland.....	Spaniards; Dutch.....	The battle terminated in a horrible butchery of the patriot army.
Morgarten (mör'gär-ten).....	1315, Nov. 15.....	Switzerland.....	Swiss; Austrians.....	The first battle fought for Swiss independence.
Moscow (mos'cow).....42	1461, Feb. 2.....	England.....	Yorkists; Lancastrians.....	The Yorkist prince advanced to London and was proclaimed king as Edward IV.
Mukden (muk-den).....71	1903, Feb. 24 to March 10.....	Manchuria.....	Japanese; Russians.....	Release of Japanese from before Fort Arthur enables Oyama to crush Kuropatkin.
Mühlsberg (mül'berg).....44	1547, April 24.....	Saxony.....	Charles V. and Prince Maurice; Saxony and Home.....	Maurice in 1552 retrieves his treason to Protestantism by driving Charles V. from Germany.
Muhlberg (mül'dorf).....	1322, Sept. 28.....	Bavaria.....	Louis of Bavaria; Frederick of Austria.....	The disputed imperial election, over which this battle was fought, began a new struggle between empire and papacy.
Munda (mun'da).....24	B. C. 45.....	Spain.....	Julius Cæsar; Pompeians.....	Cæsar's last battle; it put an end to armed resistance.
Muret (mü-ret).....	1213, Sept. 12.....	France.....	Crusaders; Albigenses and Aragonese.....	Practically ends the Albigensian crusade; Toulouse territories pass ultimately to the French crown.
Mycale (mik'-ä-le).....5	B. C. 479.....	Asia Minor.....	Greeks; Persians.....	This battle and that of Plataea and the Persian war were decided here.
Mytilene (mü'ti-le).....14	B. C. 260.....	Sicily.....	Romans; Carthaginians.....	First naval victory of Romans; due to boarding bridges.
Näfels (nä-fels).....	1388, April 9.....	Switzerland.....	Swiss; Austrians.....	Habsburgs renounced all feudal claims over the Swiss cantons (1389).
Nancy (nan'-ä).....	1477, Jan. 5.....	Lorraine.....	Swiss; Charles the Bold.....	Charles was slain, leaving his motley territories over to William III.
Narva (nä-rä).....51	1700, Nov. 30.....	Russia.....	Swedes; Russians.....	Charles XII won a brilliant victory over the much larger army of Peter the Great.
Naseby (nä-sä).....48	1645, June 14.....	England.....	Parliamentarians; Royalists.....	Complete defeat of Charles I., followed by the general ruin of his cause.
Naupactus (nä-pak'tus).....7	B. C. 429.....	Gulf of Corinth.....	Athenians; Peloponnesians.....	Victory wrested from defeat by the genius of Themistocles, the Athenian commander.
Navarino (nä-vä-rä).....58	1827, Oct. 20.....	Greece.....	English; French and Russians; Turks.....	Destruction of Turkish naval power; Ibrahim retreats from Morea.
Navas de Tolosa (nä-fä).....34	1212, July 16.....	Spain.....	Spaniards; Moors.....	Islamic supremacy and preponderance of Christianity in Spain.
Neerwinden (nä-vin-den).....49	1693, July 24.....	Belgium.....	French; English.....	The French won a brilliant but barren victory over William III.
Neville's (nä-vil's) Cross.....39	1246, Oct. 17.....	England.....	English; Scots.....	Scots crushed at home, while Edward III. was winning Crécy.
New Orleans (drü-nans).....57	1815, Jan. 8.....	Louisiana (U. S. A.).....	Americans; British.....	On account of a miscommunication, Jackson fought this battle after peace had been made.
Niema (ni-nä).....36	1067.....	Asia Minor.....	Crusaders; Turks.....	First conquest of crusaders in the East.
Nicopolis (ni-kop'-olis).....	B. C. 66.....	Asia Minor.....	Pompey; Mithradates.....	Mithradates' last fight against the legions of Rome.
Nördlingen (nörd'-ling-en).....47	1634, Sept. 6.....	Bavaria.....	Catholics and Imperialists; Swedes and German Protestants.....	One of the most bloody and decisive battles of the war; followed by the peace of Prague.
Northampton (nörth-amp'ton).....42	1460, July 10.....	England.....	Yorkists; Lancastrians.....	Capture of Henry VI.; fight of Queen Margaret and her son to Scotland.
Numantia (nä-man'-shi-ä).....	B. C. 142-133.....	Spain.....	Romans; Celtiberian tribes.....	Inhabitants sold as slaves.
Obbligato (obli'-gä-to).....	1845, Nov. 28.....	Argentina.....	British and French; Argentines.....	Over the opening the waters of the Paraná to the shipping of all nations.
Orontas (ör'-ontas).....53	1758, May 27-July 1.....	Moravia.....	Austrians; Prussians.....	General Daun forced Frederick the Great to raise the siege and retire.
Orleans (ör'-ä-lä).....39	1428-9, Oct. 12-May 8.....	France.....	French; English.....	Joan of Arc saves France by driving back English and crowns Charles VII. at Rheims.
Ostend (ot-end).....46	1601-4, July-Sept.....	Belgium.....	Spaniards; Dutch garrison and inhabitants.....	Scarcely a house in the town left standing; Spaniards lost 70,000.
Ostroleka (ot-roleng'-kä).....	1831, May 26.....	Poland.....	Russians; Poles.....	Poland becomes a province of the Russian empire (1832).
Otterburn (ot'er-bürn).....	1388, Aug. 10.....	England.....	Scots; English.....	The ballad of Chevy Chase deals with this battle.
Otumba (öt-üm-bä).....	1320, July 8.....	Mexico.....	Cortes; Aztecs.....	Two hundred Spanish horsemen rout an immense army and make good their retreat.
Oudenarde (ou-de-nä-rä).....50	1708, July 11.....	Belgium.....	English and Imperialists; French.....	One of the great victories of Marlborough.
Palmira (pal-mi-rä).....	272-273.....	Syria.....	Romans; Queen Zenobia.....	City saved by Scipio Aemilianus and its inhabitants sold as slaves.
Palo Alto (pä-lä-dil'-to).....59	1846, May 8.....	Mexico.....	Americans; Mexicans.....	Palmira destroyed and Zenobia taken captive to Rome.
Panormus (pa-nör'-mus).....41	B. C. 251.....	Sicily.....	Romans; Carthaginians.....	Mexicans completely routed at small cost to the victors.
Paris (pä-rä).....66	1870-1, Sept. 10-Jan. 28.....	France.....	Prussians; French.....	Brilliant victory restored confidence to Republicans; demonstrated value of elephants in warfare.
Pavia (pä-vä).....43	1525.....	Italy.....	France.....	City reduced to desperate conditions through Emperor Charles V. and Francis I. of France.
Pharsalus (fär-nä-lus).....24	B. C. 48.....	Greece.....	Cæsar; Pompey.....	The capture of Francis was followed by the peace of Madrid, which, however, was soon repudiated.
Philippi (ä-dip'-i).....24	B. C. 42.....	Thrace.....	Antony and Octavius; Brutus and Cassius.....	The West and the new monarchy completely triumphed over the East and the old republic.
Pinkie (ping'-ä).....	1547, Sept. 10.....	Scotland.....	English; Scots.....	Cassius and Brutus committed suicide following their defeat.
Plassy (pläs'-ä).....53	1757, June 23.....	India.....	English; Bengalees.....	Scots thrown into the arms of France and the little queen, Mary, married to the dauphin.
Plataea (plä-tä-ä).....5	B. C. 479.....	Greece.....	Greeks; Persians.....	Established English control in Bengal and ultimately in all India.
				Won by the discipline and prowess of the Spartan hoplites.

## NOTABLE BATTLES OF UNIVERSAL HISTORY—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMBATANTS	REMARKS
Plevna (plev'ná), Siege of.....	1877, July 16-Dec. 10	Bulgaria.....	Russians; Turks.....	Brilliant defense by Osman Pasha, who surrendered only after long desperate battle.
Poitiers (poi-ti-ers).....	1356, Sept. 19.....	France.....	English; French.....	Brilliant victory by the Black Prince over the French.
Polotsk (pó-lot'sk).....	402, April 6.....	Italy.....	Romans; Visigoths.....	Alaric, attacked by Stilicho on Easter Sunday, was driven out of Italy.
Pondichéry (pon-dí-cher-í), Siege of.....	1760-1, Aug.-Jan. 18	India.....	English; French.....	Destroyed French power in India.
Port Arthur, Siege of.....	1904-5, Feb. 8-Jan. 1	Manchuria.....	Japanese; Russians.....	Port Arthur, the Sea of Japan and Makden were turning points in the war.
†Portland (pórt-lánd), Siege of.....	1853, Feb. 18-20.....	English channel.....	English; Dutch.....	This battle completely restored to England the lordship of the sea.
Potidaea (pó-tí-dá-á), Siege of.....	B. C. 432, Sept.-430	Thrace.....	Athenians; Potidaeans and Corinthians.....	Inhabitants and foreign soldiers were allowed to leave the city, which Athens then colonized.
Prague (pra-gú), (White Hill).....	1620, Nov. 8.....	Bohemia.....	Catholic League; Frederick V. and Bohemian rebels.....	Frederick proved but a "Winter King" of Bohemia.
Preston (pres-tun).....	1648, Aug. 17-19.....	England.....	Cromwellians; Scottish Royalists.....	This second civil war determined the army to put Charles I. to death.
Pultava (pólt'-á-vá).....	1709, July 8.....	Russia.....	Russians; Swedes.....	Russia takes the place of Sweden as the leading power of the North.
Pydna (pí-dá).....	B. C. 168.....	Macedonia.....	Romans; Macedonians.....	Brilliant triumph of Paulus Æmilius over the phalanx of King Perseus.
Pyramids.....	1798, July 21.....	Egypt.....	French; Mamelukes.....	The crowning victory of Napoleon in Egypt.
Pyrenees (pi-ré-né-ás), Battles of.....	1813, July 25-Aug. 1	Spain.....	British and Spaniards; French.....	Victories by the fall of San Sebastian and Pampeluna, and expulsion of French from Spain.
Quatre Bras (kwa-tré-brá).....	1815, June 16.....	Belgium.....	British and Allies; French.....	The allied success here was rendered fruitless by the Prussian reverse at Ligny.
†Quiberon (kí-ber-n) bay.....	1759, June-Sept. 18.....	Canada.....	British; French.....	Wolfe was slain and Montcalm mortally wounded in the battle of the Plains of Abraham (Sept. 13).
Ramillies (rá-mí-li-és).....	1767, May 23.....	Belgium.....	English and Allies; French.....	Hawke, with a loss of 40 men, captured, hurried, or drove on shore most of the French vessels.
Rhe (ró), Siege of.....	1602, July 20-Nov. 8	France.....	French; English.....	Followed by French evacuation of the chief town of the Netherlands.
Rhodes (ró-ds, or Rhodós (ró-dós), Siege of.....	1322, July 28-Dec. 26	Mediterranean.....	Turks; Knights of Rhodes.....	An attempt of Buckingham to prevent the rebuilding of the Huguenot stronghold of La Rochelle.
Rieti (rí-tí).....	1871, March 7.....	Italy.....	Austrians; Neapolitan rebels.....	Following the loss of Rhodes the Knights (the hospitalers) fled to Malta.
Rivoli (rí-vó-lí).....	1797, Jan. 14-15.....	Italy.....	French; Austrians.....	The defeat of General Pope enabled Austria to restore the absolute monarchy.
Rocroi (ró-kroí).....	1643, May 19.....	France.....	French; Spaniards.....	Napoleon's victory, followed by surrender of Mantua, completed the conquest of Lombardy.
Rome, Sack of.....	B. C. 390.....	Italy.....	Gauls.....	This victory, won by Cincinnatus, made France the first military power of Europe.
Rome, Sieges of.....	408, 409, 410.....	Italy.....	Visigoths; Romans.....	Following the battle of the Allia, the Gauls followed the destroyed by the Gauls.
Rome, Sack of.....	455.....	Italy.....	Visigoths; Romans.....	Following the third siege, Alaric sacked the city.
Rome, Storm of.....	1527, May 6.....	Italy.....	Mutinous Army of Charles V.; Papal troops.....	For fourteen days Genesio's Vandals plundered Rome.
Rome, Siege of.....	1849, June 4-July 3.....	Italy.....	French and Papalists; Roman Republicans.....	Made the end of the artistic, pleasure-loving Rome of the Renaissance.
Roncesvalles (ró-n-cho-vál'-es).....	778.....	Spain.....	Basques; Franks.....	The republic, founded by Maximal, overthrown and Pope Pius IX. restored.
Roosebeck (róo-bek).....	1382, Nov. 27.....	Flanders.....	French; Flemings.....	Death of Charlemagne's paladin, Roland (Chanson de Roland).
Rossbach (róo-bak).....	1757, Nov. 5.....	Saxony.....	Prussians; French and Austrians.....	A great triumph for the nobles against the cities.
Rouen (róo-an), Siege of.....	1418-9, June-Jan.	France.....	English; French.....	Makes Frederick the Great a national hero of Germany.
Rapriortis (rá-pí-rí-ó-rí-tis).....	B. C. 82.....	Italy.....	Optimates; Democrats.....	Because of its desperate resistance, Henry V. granted the city honorable capitulation.
Ragunum (rá-gu-núm), Siege of.....	B. C. 219.....	Spain.....	Carthaginians; Inhabitants.....	Followed by Sulla's reign of terror.
St. Albans (sán-tí-á-lbans).....	1455, May 22.....	England.....	Yorkists; Lancastrians.....	Capture of this city by Hannibal the chief cause of the second Punic war.
Salamanca (sál-dá-mang-ká).....	1812, July 22.....	Spain.....	British; French.....	The first battle of the war of the Roses; Yorkists defeated here in a second battle (1460).
†Salamis (sál'-á-mis).....	B. C. 480, Sept. 20.....	Greece.....	British; French.....	This rout of the French lost them all their eastern empire.
San Jacinto (sán-já-sín-tí).....	1836, April 2.....	TEXAS, U. S. A.....	Greeks; Persians.....	This rout of the French lost them all their eastern empire.
†Santiago (sán-tí-á-gí).....	1898, July 3.....	Cuba.....	Texan rebels; Mexicans.....	Thermopylae great victory followed by "Xerxes" withdrawal to Asia.
Sargassos (sá-rá-sos), Siege of.....	1808-9, Dec.-Feb. 21	Spain.....	Americans; Spaniards.....	Santa Anna captured by General Houston.
Saratoga (sá-rá-tó-gá).....	1777, Oct. 7.....	New York U. S. A.....	British; French.....	Fleet of Admiral Cervera totally destroyed.
Sea of Japan.....	1905, May 27-29.....	Sea of Japan.....	British; French.....	An important success which broke the spell of French invincibility.
Sebastopol (sé-bás-tó-pól), Siege of.....	1854-5, Sept. 26-Sept. 9.....	Crimes.....	Americans; British.....	Followed (Oct. 17) by the surrender of Berezova, which was the turning point of the war.
Sedan (sá-dán).....	1870, Sept. 1.....	France.....	French, British and Sardinians; Russians.....	Russia's naval power destroyed.
Shipka (ship-ká) pass.....	1877, Aug. 20-23.....	Bulgaria.....	Prussians; French.....	Brought to a close the active operations of "Crimean war."
Sempach (sem-pák).....	1386, July 9.....	Switzerland.....	Russians; Turks.....	Followed by the surrender of Napoleon III. with an army of 84,000 men.
Sentinio (sem-tí-nío).....	B. C. 295.....	Italy.....	Russians; Turks.....	Russians held this strategic position against kindred violence of the Turks.
Seringapatam (ser-ing-pá-tám), Siege of.....	1799, Apr. 24-May 4	India.....	Swiss; Austrians.....	Celebrated for the heroic devotion of Arnold von Winkelried.
Shiloh (shí-ló).....	1862, April 6 and 7.....	Tenn., U. S. A.....	Romans; Samnites and Gauls.....	Failure of the coalition to crush Rome from the north.
Shrewsbury (shréw-ber-í).....	1403, July 21.....	England.....	British; Tippoo Sahib.....	With Bonaparte's failure in Egypt, this battle foils French designs on India.
			Federals; Confederates.....	Defeated in the first day's fighting. Grant turned the tables the second day.
			Henry IV.; Percies.....	Hotspur defeated and slain.





## NOTABLE BATTLES OF UNIVERSAL HISTORY—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	CONTESTANTS	REMARKS
Trebia ( <i>tré-bi-d</i> )	218, Dec.	Italy	Carthaginians; Romans	By this splendid victory Hannibal justified his march into Italy; the way into Etruria was now open to him.
Tunis ( <i>tú-nis</i> ). Siege of	1270.	N. Africa	Moslems; French Crusaders	This crusade, in which Louis IX. lost his life, was the last.
Turin ( <i>tú-rin</i> )	1706, Sept. 7.	Italy	Prince Eugene; French	The French were permanently excluded from Italy.
Tyrrhene ( <i>tir</i> ). Siege of	B. C. 332, Jan.-Aug.	Phoenicia	Macedonians; Tyrians	The greatest of Alexander's triumphs; Alexandria in Egypt took the place of Tyre as a commercial metropolis.
Ushant ( <i>ush-ant</i> )	1794, June 1.	N. Atlantic	British; French	A brilliant victory won by Lord Howe.
Valmy ( <i>val-mí</i> )	1793, Sept. 2.	France	French; Prussians	Goethe said that from Valmy dates a new era. It showed that revolutionary France would and could resist Europe.
Varna ( <i>vár-na</i> )	1444, Nov. 10.	Bulgaria	Turks; Hungarians	King Ladislaus lost his life and his army was scattered to the winds.
Verceil ( <i>ver-cel</i> )	B. C. 101, July 30.	Italy	Romans; Cimbri	Marius and Catulus utterly destroyed the vast barbarian horde, which had been threatening Italy with invasion.
Vicksburg, Siege of	1863, May 19-July 4.	Miss., U. S. A.	Federals; Confederates	Grant's success at Vicksburg, together with the battle of Gettysburg, were the turning points of the war.
Vienna ( <i>vé-en</i> ). Siege of	1683, July 14-Sept. 12	Austria	Austrians; Turks	The besiegers were reduced to the last extremity when Sobieski intervened and put the invading Turks to flight.
Vigo ( <i>ví-gó</i> ) bay	1702, Oct. 12.	Spain	English and Dutch; French and Spaniards	The destruction of the Spanish galleons and the protecting French fleet gave a blow to the finances and prestige of the two crowns.
Vimiero ( <i>ví-mí-er</i> )	1813, Aug. 21.	Spain	British; French	Wellington inflicted a signal defeat on the French, but his senior officer made no use of the victory.
Vitoria ( <i>ví-tó-rí</i> )	1813, June 21.	Spain	British; French	This, the crowning victory of Wellington's peninsular campaign, won Spain from Napoleon.
Wagram ( <i>wá-grám</i> )	1809, July 6.	Austria	French; Austrians	One of the most terrible and least decisive battles of all time.
Wakefield	1460, Dec. 30.	England	Lancastrians; Yorkists	Queen Margaret's army completely defeated that of the duke of York, who was slain on the battlefield.
Wandewash ( <i>wán-de-wash</i> )	1760, Jan. 22.	India	British; French	Cook's victory was the death-blow to French power in India.
Warsaw ( <i>wár-sá</i> ). Siege of	1831, Aug. 19-Sept. 7	Poland	Russians; Poles	The fall of Warsaw ended the Polish insurrection and Poland becomes a province of the Russian empire.
Waterloo ( <i>wá-ter-ló</i> )	1815, June 18.	Belgium	British and Prussians; French	The final overthrow of Napoleon by Wellington and Blücher. Napoleon was transported to St. Helena, where he died in 1821.
Watre ( <i>wá-tr</i> )	1815, June 18.	Belgium	French; Prussians	Grouchy's victory was useless, while he was to have saved the day for Napoleon had he arrived at Waterloo who expected.
Wei-hai-Wei ( <i>wéi-hái-wéi</i> )	1894, Jan. 30-Feb. 12.	China	Japanese; Chinese	The Chinese admiral gave up the remnant of his fleet and killed himself, followed by negotiations for peace.
Westerlo ( <i>wéi-ter</i> )	1651, Sept. 3.	England	Cromwellians; Scottish Royalists	Followed by the submission of Scotland and Charles II.'s adventurous escape to France.
Würzburg ( <i>wúr</i> )	1870, Aug. 6.	Bavaria	Prussians; French	A bloody contest and a decisive victory, followed by the retreat of the French from southern Germany.
Xerxes ( <i>hí-rís</i> )	711, July 19.	Spain	Moor; Visigoths	Without having to fight any second battle, the Moors under Tariq defeated Spain.
Yalu ( <i>yá-lá</i> ) river	1894, Sept. 17.	Manchuria	Japanese; Chinese	This action conferred upon the Japanese the full command of the sea and greatly aided the land-power.
Yorktown, Siege of	1781, Sept. 30-Oct. 19	Va., U. S. A.	Americans; British	The surrender of Cornwallis at Yorktown practically brought to an end the war of the American Revolution.
Zama ( <i>zá-má</i> )	B. C. 202.	N. Africa	Romans; Carthaginians	Scipio defeated Hannibal and annihilated his army, thus ending the second Punic war.
Zorndorf ( <i>zór-dorf</i> )	1758, Aug. 25.	Prussia	Prussians; Russians	A desperate and bloody struggle, after which the Russians retired into Poland.
Zurawno ( <i>zú-raw-no</i> ). Siege of	1676.	Austria	Poles; Turks	John Sobieski made a heroic defense against numbers and won an honorable peace.

## AMERICAN BATTLES TABULATED

Naval engagements are printed in *italics*; names of victorious commanders in **bold-face** type. \*Drawn battle. †General estimate.

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPOSITS	CASUALTIES			
					VICTOR	UNITED STATES	OPPOSITS	
						Killed	Killed	Wounded
<b>Aguadores</b> , including July 1st.	July 2, 1898.	Cuba.	<b>Gen. Shafter</b> (U. S.)	Spanish	U. S.	0	12	10
<i>Albatraz</i> .	Feb. 11, 1863.	South Carolina.	<b>Lt. Com. F. A. Roe</b> vs. <b>Capt. J. W. Cooke</b> .	Conf.	U. S.	0	21	162
<i>Albemarle</i> .	May 5, 1864.	Albemarle Sound, North Carolina.	<b>Lt. W. B. Cushing</b> vs. <b>Capt. Cooke</b> .	Conf.	U. S.	4	25	0
<i>Albemarle</i> .	Oct. 27, 1864.	Plymouth, North Carolina.	<b>Gen. Corne</b> vs. <b>Gen. Johnston</b> .	Conf.	U. S.	2	0	0
<i>Albatraz</i> .	Oct. 5, 1864.	Georgia.	<b>Capt. John Paul Jones</b> (U. S.)	Conf.	U. S.	142	352	338
<i>Alfred—Transport</i> .	Nov. 13, 1776.	Cape Canoe.	<b>Capt. John Barry</b> vs. <b>Com. Sampson</b> Edwards and <b>Com. James Smith</b> .	English.	U. S.	0	2	2
<i>Alliance—squadron</i> .	May 28, 1781.	North Atlantic.	<b>Sailing Master Bassett</b> .	English.	U. S.	5	20	11
<i>Aligator</i> .	Jan. 29, 1814.	Cole's Island, North Atlantic.	<b>Capt. James W. Chever</b> vs. <b>Capt. Edward L. Gower</b> .	Conf.	U. S.	2	2	8
<i>America—Elizabeth</i> .	March 2, 1815.	Porto Rico.	<b>Capt. Isiah Robinson</b> vs. <b>Lt. Jones</b> .	Conf.	U. S.	8	16	22
<i>Anderson's Cross-Roads</i> .	Oct. 2, 1863.			Conf.	U. S.	4	8	6
<i>Andra Dorio—Racehorse</i> .	Aug. 12, 1776.			English.	Eng.	1	1	0
<i>Antelope—Zephyr</i> .	March 17, 1813.							

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPONENTS	
						Killed	Wounded	Killed	Wounded
<b>Antietam.</b>	Sept. 16-17, 1862.	Maryland.	<b>Gen. McClellan</b> vs. <b>Gen. Lee.</b>	Conf.	U. S.	2,010	9,416	1,842	9,399
<b>Appomattox.</b>	April 9, 1865.	Virginia.	<b>Gen. Grant</b> vs. <b>Gen. Lee.</b>	Conf.	U. S.	203	297	189	386
<b>Argus—Pelican.</b>	Aug. 14, 1813.	St. David's Head	<b>M. Com. W. H. Allen</b> vs. <b>Capt. John F. Maples.</b>	English.	Eng.	6	17	2	5
<b>Arkansas.</b>	July 15, 1862.	Mississippi.	<b>Capt. Davis</b> vs. <b>Capt. Montgomery.</b>	Conf.	U. S.	18	50	10	15
<b>Arkansas Post.</b> Jan. 10.	Jan. 10-11, 1863.	Arkansas.	<b>Gen. Logan</b> vs. <b>Gen. Porter</b> (U. S.)	Conf.	U. S.	6	25	10†	30†
<b>Arkansas Post, ended</b> Jan. 11.				Conf.	U. S.	129	831	60	78
<b>Arrow Rock.</b>	Oct. 12-13, 1863.	Missouri.	<b>Gen. E. B. Brown</b> vs. <b>Gen. Shelby</b> and <b>Gen. Coffee.</b>	Conf.	U. S.	45	162	84	205
<b>Assault on Savannah.</b>	Oct. 9, 1879.	Georgia.	<b>Gen. Prentiss</b> vs. <b>Count D'Estaing</b> and <b>Gen. Lincoln.</b>	English.	Eng.	68	173	18	37
<b>Asp, Attack on the.</b>	July 14, 1813.	Yocomico Creek	<b>Lt. Roger C. Curry</b> vs. <b>Madsen</b> and <b>J. H. Sigourney.</b>	Conf.	Eng.	4	6	10	21
<b>Athens.</b>	Sept. 23, 1864.	Alabama.	<b>Gen. Forrest</b> vs. <b>Col. Campbell.</b>	Conf.	Conf.	0	0	12	18
<b>Atlanta, Hood's first sortie.</b>	July 22, 1864.	Georgia.	<b>Gen. Logan</b> vs. <b>Gen. Hood.</b>	Conf.	U. S.	499	2,142	1,162	7,337
<b>Atlas—Planter and Pursuit.</b>	Aug. 3, 1812.	North Atlantic.	<b>Capt. David Moffitt</b> (U. S.)	Conf.	U. S.	2	5	2	4
<b>Attack on Tripoli.</b>	Aug. 3, 1804.	North Africa.	<b>Commodore Peble</b> vs. <b>the Day of Tripoli.</b>	Tripolitan.	*	1	13	60	70
<b>Attack on Tripoli.</b>	Aug. 7, 1804.	North Africa.	<b>Commodore Peble</b> vs. <b>the Day of Tripoli.</b>	Tripolitan.	*	22	6	50†	80†
<b>Autosse.</b>	Nov. 29, 1813.	Alabama.	<b>Gen. John Floyd.</b>	Indiana.	U. S.	11	54	204	0
<b>Avery'sboro.</b>	March 10, 1865.	North Carolina.	<b>Maj. Gen. Slocum</b> vs. <b>Lt. Gen. Hardee.</b>	Conf.	U. S.	77	477	86	632
<b>Bachelor's Creek.</b>	Feb. 1, 1864.	North Carolina.	<b>Gen. G. E. Fickett</b> vs. <b>Gen. J. W. Palmer.</b>	Conf.	Conf.	24	77	13	22
<b>Ball's Bluff.</b>	Oct. 21, 1861.	Virginia.	<b>Gen. Evans</b> vs. <b>Col. Edwin D. Baker.</b>	Conf.	Conf.	223	226	58	242
<b>Batesville.</b>	Feb. 4, 1863.	Arkansas.		Conf.	U. S.	2	4	8†	7†
<b>Baton Rouge.</b>	Aug. 5, 1862.	Louisiana.	<b>Gen. Thomas Williams</b> vs. <b>Gen. Breckinridge.</b>	Conf.	U. S.	99	203	123	234
<b>Baxter's Springs.</b>	Oct. 4, 1863.	Kansas.		Conf.	Conf.	60	21	12	32
<b>Bayou Meten.</b>	Aug. 27, 1863.	Arkansas.	<b>Col. J. M. Glover</b> (U. S.)	Conf.	U. S.	2	8	11	31
<b>Bear River.</b>	Jan. 29, 1863.	Utah.	<b>Col. F. E. Connor.</b>	Indiana.	U. S.	12	49	224	8
<b>Beaver Dam.</b>	June 24, 1813.	Canada.	<b>Lt. Fitzgibbon</b> vs. <b>Col. Boerstler.</b>	English.	Eng.	25	50†	30†	24
<b>Belmont.</b>	Nov. 6-7, 1861.	Missouri.	<b>Gen. Pillow</b> vs. <b>Gen. Grant.</b>	Conf.	U. S.	90	173	231	682
<b>Bennington.</b>	Aug. 16, 1777.	Vermont.	<b>Gen. Stark</b> vs. <b>Col. Baum</b> and <b>Col. Breyman.</b>	English.	U. S.	30	41	59	81
<b>Bentonville.</b>	March 18, 1865.	North Carolina.	<b>Gen. J. C. Davis</b> vs. <b>Gen. Johnston.</b>	Conf.	U. S.	101	1,108	267	1,381
<b>Bermuda Hundreds.</b>	May 26-30, 1864.	Virginia.	<b>Gen. Butler</b> vs. <b>Gen. D. H. Hill.</b>	Conf.	U. S.	201	998	864	2,136
<b>Beverly Ford, also known as Fleetwood and Brandy Station.</b>	June 9, 1863.	Virginia.	<b>Gen. Pleasanton</b> vs. <b>Gen. Stuart.</b>	Conf.	Conf.	156	280	253	354
<b>Beverly, W. Va.</b>	Jan. 11, 1865.	West Virginia.		Conf.	Conf.	5	20	3	6
<b>Big Blue.</b>	Oct. 24-25, 1864.	Missouri.	<b>Gen. S. B. Curtis</b> and <b>Gen. Pleasanton</b> vs. <b>Gen. Price.</b>	Conf.	U. S.	41	62	78	135
<b>Big Creek.</b>	July 26, 1864.	Arkansas.		Conf.	U. S.	18	32	48	102
<b>Big Horn.</b>	June 25, 1876.	Montana.	<b>Sitting Bull</b> vs. <b>Gen. Custer.</b>	Indian.	Ind.	261	0	81	126
<b>Black River.</b>	May 17, 1863.	Louisiana.	<b>Gen. Cart</b> vs. <b>Gen. Pemberton.</b>	Conf.	U. S.	29	242	40	186
<b>Bladensburg.</b>	Aug. 24, 1814.	Maryland.	<b>Gen. Ross</b> vs. <b>Gen. Winder.</b>	English.	Eng.	30	42	183	297
<b>Blooming Gap.</b>	Feb. 13, 1862.	Virginia.	<b>Gen. F. W. Lander</b> vs. <b>Gen. Jackson.</b>	Conf.	U. S.	0	2	13	26
<b>Blue Springs.</b>	Oct. 10, 1863.	Tennessee.	<b>Gen. Burnside</b> vs. <b>Gen. B. Jones.</b>	Conf.	U. S.	33	62	48	94
<b>Boat Attack on Charleston.</b>	Jan. 31, 1863.	South Carolina.	<b>Flag Officer D. N. Ingraham</b> vs. <b>R.-Adm. H. A. DuPont.</b>	Conf.	Conf.	23	87	0	2
<b>Boats—Black Snake.</b>	Sept. 3, 1780.			English.	U. S.	0	2	3	5
<b>Boats—Tender to Nautilus.</b>	June 8, 1776.			English.	U. S.	1	3	4	16
<b>Bonhomme Richard—Serapis.</b>	Sept. 23, 1779.	North Sea.	<b>Capt. John Paul Jones</b> vs. <b>Capt. Pearson.</b>	English.	Eng.	49	67	49	68
<b>Boston—Beechey.</b>	Oct. 12, 1800.	51° West 22° 55' N.	<b>Capt. George Little</b> vs. <b>Capt. André Nenez.</b>	French.	U. S.	4	11	4	17
<b>Boynton and White Oak Road.</b>	March 31, 1865.	Virginia.	<b>Hancock, Crawford, Pierce, Gregg</b> vs. <b>Hith, Hampton.</b>	Conf.	U. S.	177	1,134	236	998
<b>Brandywine.</b>	Sept. 11, 1777.	Delaware.	<b>Lord Cornwallis</b> vs. <b>Gen. Washington.</b>	English.	Eng.	280	568	98	398
<b>Brice's Cross-Roads.</b>	June 10, 1864.	Mississippi.	<b>Gen. N. B. Forrest</b> vs. <b>Gen. E. D. Sturgis.</b>	Conf.	Conf.	223	394	124	582
<b>Bridgeport, West Bridge.</b>	April 29, 1862.	Alabama.	<b>Gen. O. M. Mitchell</b> vs. <b>Gen. E. Kirby Smith.</b>	Conf.	U. S.	3	8	31	42
<b>Bristow Station.</b>	Oct. 14, 1863.	Virginia.	<b>Gen. G. K. Warren</b> vs. <b>Gen. Hill.</b>	Conf.	*	50	150	150	250

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPONENTS	
						Killed	Wounded	Killed	Wounded
Brownstown.	Aug. 4, 1812.	Michigan.	Tecumseh vs. Maj. Thomas B. Van Horne	English.	Eng.	17	30	0	0
Buckland's Mills.	Oct. 19, 1863.	Virginia.	Gen. J. E. B. Stuart vs. Gen. G. A. Custer.	Conf.	Conf.	8	23	4	31
Buena Vista.	Feb. 22-23, 1847.	Mexico.	General Taylor vs. Gen. Santa Anna.	Mexican.	U. S.	267	456	568	1,241
Bull Run.	July 21, 1861.	Virginia.	Gen. Beauregard and Gen. Johnston vs. Gen. McDowell.	Conf.	Conf.	481	1,011	362	1,390
Bull Run No. 2.	Aug. 29-30, 1862.	Virginia.	Gen. Lee and Gen. Jackson vs. Gen. Pope.	Conf.	Conf.	798	4,023	1,090	6,184
Bunker Hill.	June 17, 1775.	Massachusetts.	Gen. Gage vs. Gen. Warren, Gen. Putnam and Col. Prescott.	English.	Eng.	145	304	359	693
Cabin Creek.	July 1, 1863.	Oklahoma.	Col. Williams vs. Col. Stand Wadde.	Conf.	U. S.	8	15	42	108
Cache Swamp.	July 7, 1862.	Arkansas.	Col. C. E. Hovey vs. Gen. Hunt.	Conf.	U. S.	8	45	110	150
Caledonia and Detroit—boats.	Oct. 7, 1812.	Lake Erie.	Lt. Elliot vs. Mr. Irvine and Lt. Rosette.	English.	U. S.	1	4	5	10
Camden.	Aug. 16, 1780.	South Carolina.	Lord Cornwallis vs. Gen. Gates.	English.	Eng.	94	281	80	245
Camp McColla.	June 11-14, 1898.	Cuba.	Lt. Col. R. W. Hunt-ington and Capt. G. F. Elliott.	Spanish.	U. S.	6	11	601	1407
Campbell Station.	Nov. 16, 1863.	Tennessee.	Gen. Burnside vs. Gen. Longstreet.	Conf.	Conf.	112	186	136	214
Camp Defiance.	Jan. 27, 1814.			Indiana.	U. S.	17	132	37	0
Cane River.	April 23, 1864.	Louisiana.	Gen. W. H. Emory vs. Gen. B. E. Bee.	Conf.	U. S.	98	152	108	164
Cannons—Melant.	April 13, 1813.			English.	Eng.	1	3	0	4
Cannon—Wareside.	March 1, 1813.			English.	Eng.	1	3	0	1
Canton Forts.	Nov. 20-22, 1836.	China.		Chinese.	Chinese.	12	28	400	540
Cape Girardeau.	April 26, 1863.	Missouri.	Gen. McNeil vs. Gen. Marmaduke.	Conf.	U. S.	6	18	22	43
Carney's Bridge.	Jan. 14, 1863.			Conf.	U. S.	7	27	14	36
Castletown.	July 7, 1777.	Vermont.	Gen. Frazer vs. Col. Francis and Col. Warner.	Conf.	Eng.	211	563	35	144
Catawba Fords.	Aug. 19, 1780.	South Carolina.	Col. Tarleton vs. Hunter.	English.	Eng.	162	281	2	21
Cedar Creek.	Oct. 19, 1864.	Virginia.	Gen. Sheridan vs. Gen. Early.	Conf.	U. S.	588	3,516	961	3,229
Cedar Mountain.	Aug. 8-9, 1862.	Virginia.	Gen. Jackson vs. Gen. Banks.	Conf.	Conf.	450	660	223	1,000
Cerro Gordo.	April 18, 1847.	Mexico.	Gen. Scott vs. Gen. Santa Anna.	Mexican.	U. S.	63	368	1001	5007
Champion Hills.	May 16, 1863.	Mississippi.	Gen. Grant vs. Gen. Pemberton.	Conf.	U. S.	426	1,842	486	1,954
Chancellorsville.	April 30-May 4, 1863.	Virginia.	Gen. Lee and Gen. Jackson vs. Gen. Hooker.	Conf.	Conf.	1,512	9,518	1,718	10,563
Chapultepec.	Sept. 13, 1847.	Mexico.	Gen. Scott vs. Gen. Santa Anna.	Mexican.	U. S.	116	671	1,000	2,000
Charming Sally—Renew.	June 4, 1782.			English.	U. S.	1	4	3	6
Chasseur—St. Lawrence.	Feb. 25, 1815.	Cuba.	Capt. Boyle vs. Lt. Henry Cramer Gordon.	English.	U. S.	5	8	15	23
Chattahoochee.	July 6-10, 1864.	Georgia.	Gen. Sherman vs. Gen. Johnston.	Conf.	U. S.	80	480	201	402
Chattanooga, including Orchard Knob, Lookout Mountain and Missionary Ridge.	Nov. 23-25, 1863.	Tennessee.	Gen. Grant, Gen. Sherman and Gen. Hooker vs. Gen. Bragg.	Conf.	U. S.	757	4,529	860	2,150
Chesapeake—Shannon.	June 1, 1813.	Massachusetts Bay.	Capt. Broke vs. Capt. Lawrence.	English.	Eng.	47	99	24	59
Chestnut Hill.	Dec. 7, 1777.	Pennsylvania.	Gen. Morgan (U. S.) vs. Gen. Cornwallis (Eng.).	English.	U. S.	14	36	42	64
Chickamauga.	Sept. 18-20, 1863.	Georgia.	Gen. Bragg vs. Gen. Rosecrans.	Conf.	Conf.	1,644	9,262	6,000	10,000
Chibahua.	Feb. 27, 1847.	Mexico.	Gen. Taylor vs. Gen. Santa Anna.	Mexican.	U. S.	3	5	33	67
Chippewa.	July 8, 1814.	New York.	Gen. Brown vs. Gen. Riall.	English.	U. S.	60	244	199	328
Chrysler's Fields.	Nov. 11, 1813.	Canada.	Lt. Col. Morrison and Lt. Col. Pearson vs. Gen. Wilkinson.	English.	*	102	237	22	147
Churubusco.	Aug. 20, 1847.	Mexico.	Gen. Scott vs. Gen. Santa Anna.	Mexican.	U. S.	131	876	3,000	1,000
Cloyd's Mountain and New River Bridge.	May 9, 1864.	Virginia.	Gen. George Crook vs. Gen. A. G. Jenkins.	Conf.	U. S.	126	585	248	652
Cofferville.	Dec. 6, 1863.	Mississippi.	Gen. Van Dora vs. Col. Lee.	Conf.	Conf.	38	62	21	32
Columbia.	June 8, 1864.	Arkansas.		Conf.	U. S.	19	73	22	81

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPONENTS	
						Killed	Wounded	Killed	Wounded
<b>Columbus</b> <b>Col. Matthews.</b>	April 16, 1863. Dec. 9, 1862.	Alabama. Tennessee.	<b>Gen. Upton (U.S.).</b> <b>Col. Stanley Matthews</b> vs. <b>Gen. Joseph Wheeler.</b>	Conf. Conf.	U. S. U. S.	10 18	14 22	30 32	50 68
<b>Col. Gooding.</b> <b>Cold Harbor.</b>	April 4, 1864. June 2-3, 1864.	Louisiana. Virginia.	<b>Col. (Gooding (U.S.).</b> <b>Gen. Lee vs.</b> <b>Gen. Grant.</b>	Conf. Conf.	U. S. Conf.	8 1,905	26 10,570	18 364	39 1,336
<b>Comet—frigate.</b>	Jan. 14, 1813.	Pernambuco.	<b>Capt. Thomas Boyle</b> (U.S.)	Portuguese.	U. S.	1	3	10	14
<b>Cometa Creek.</b> <b>Commerce—brigand schooners.</b>	Aug. 3, 1814. Dec. 1, 1782.		<b>Capt. Thomas Truxton</b> (U. S.)	English.	U. S. *	2 1	8 2	10 14	29 24
<b>Concord and retreat.</b>	April 21, 1775.	Massachusetts.	<b>Major Pitcairn, (Eng.)</b>	English.	Eng.	49	34	74	199
<b>Congress—Savage.</b>	Sept. 6, 1781.	Georgia.	<b>Capt. George Geddes</b> vs. <b>Capt. Needling</b>	English.	U. S.	11	19	25	31
<b>Constellation—Insurgent.</b>	Feb. 9, 1799.	St. Kitts.	<b>Capt. Thomas Truxton</b> vs. <b>Capt. Barracott.</b>	French.	U. S.	2	3	29	41
<b>Constellation—Vengeance.</b>	Feb. 2, 1800.	Basse Terre.	<b>Capt. Thomas Truxton</b> vs. <b>Capt. A. M. Pitot.</b>	French.	U. S.	14	25	50	110
<b>Constitution—Guerrillas.</b>	Aug. 19, 1812.	N. Atlantic.	<b>Capt. Isaac Hull vs.</b> <b>Capt. Darns.</b>	English.	U. S.	7	7	15	63
<b>Constitution—Jaws.</b>	Dec. 29, 1812.	Bahia.	<b>Capt. William Bainbridge</b> vs. <b>Capt. Lambert.</b>	English.	U. S.	9	25	60	101
<b>Constitution—Cyane and Levent.</b>	Feb. 20, 1815.	Madeira Islands	<b>Capt. Stewart vs.</b> <b>Capt. Gordon Falcon and</b> <b>Capt. George Douglas.</b>	English	U. S.	4	10	35	42
<b>Contreras.</b>	Aug. 19, 1847.	Mexico.	<b>Gen. Scott vs.</b> <b>Gen. Santa Anna.</b>	Mexican.	U. S.	20	40	700	2,200
<b>Cook's Mills.</b> <b>Cora—boats.</b>	Oct. 19, 1814. Feb. 23, 1813.	Chesapeake Bay	<b>Capt. J. Gold.</b>	English.	U. S. Eng.	11 1	54 3	20 1	60 2
<b>Corinth</b>	Oct. 3-4, 1862.	Mississippi.	<b>Gen. Rosecrans vs.</b> <b>Gen. Van Dorn.</b>	Conf.	U. S.	315	1,812	1,423	5,692
<b>Courier—Andromache.</b> <b>Cowpens.</b>	Feb. 29, 1812. Jan. 17, 1781.	South Carolina.	<b>Gen. Morgan vs.</b> <b>Col. Tarleton.</b>	English. English.	Eng. U. S.	0 12	3 60	0 120	1 199
<b>Crampton Gap.</b>	Sept. 14, 1862.	Maryland.	<b>Gen. Franklin vs.</b> <b>Gen. Cobb.</b>	Conf.	U. S.	115	415	95	342
<b>Craney Island.</b>	June 22, 1813.	Virginia.	<b>Col. Beatty vs.</b> <b>Sir Sidney Beckwith and</b> <b>Admiral Warren.</b>	English.	U. S.	0	0	75†	125†
<b>Cross Keys.</b>	June 8, 1862.	Virginia.	<b>Gen. Ewell vs.</b> <b>Gen. Fremont.</b>	Conf.	*	125	495	29	302
<b>Culpepper Court-House.</b>	Aug. 1, 1863.	Virginia.	<b>Gen. Stuart (Conf.) vs.</b> <b>Gen. Buford.</b>	Conf.	*	16	95	22	104
<b>Cumberland.</b> <b>Dabney's Mills.</b>	Feb. 21, 1865. Feb. 5-7, 1865.	Maryland. Virginia.	<b>Warren, Humphreys and</b> <b>Gregg vs. Lee.</b>	Conf. Conf.	U. S. U. S.	1 233	3 1,062	2 249	8 751
<b>Decatur—Commerce.</b> <b>Decatur—Dominica.</b>	July 11, 1812. Aug. 5, 1813.	Bermudas.	<b>Capt. Dominique Diron</b> vs. <b>Lt. G. W. Barrett.</b>	English. English.	U. S. U. S.	0 4	0 16	4 18	7 45
<b>Defence—transport.</b>	June 17, 1776.	Massachusetts.	<b>Capt. Seth Harding vs.</b> <b>Major Mennis.</b>	English.	U. S.	0	9	15	30†
<b>Del Rey</b>	Sept. 9, 1847.	Mexico.	<b>Gen. Worth vs.</b> <b>Gen. Leon.</b>	Mexican.	U. S.	8	31	46	89
<b>Derna.</b> <b>Deveraux's Neck.</b>	April 15, 1813. Dec. 6, 8, and 9, 1864.	N. Africa.		Turkish. Conf.	U. S. *	6 39	8 390	10† 112	20† 228
<b>Diligent—squadron.</b> <b>Diomedes—Upton.</b>	April 15, 1813. Aug. 22, 1814.	N. Atlantic.	<b>Capt. J. Crowninshield</b> (U. S.)	English. English.	Eng. U. S.	1 0	3 0	0 1	1 2
<b>Dolphin—two ships.</b> <b>Dolphin—squadron.</b>	Sept. 2, 1812. Feb. 25, 1813.	Cape St. Vincent	<b>Capt. W. S. Stafford vs.</b> <b>Capt. W. A. Bingham.</b>	English. English.	U. S. U. S.	4 3	7 5	3 6	8 9
<b>Donaldsonville.</b>	June 28, 1863.	Louisiana.	<b>Maj. Porter vs.</b> <b>Gen. Green.</b>	Conf.	U. S.	1	3	85	114
<b>Dover.</b>	Feb. 3, 1863.	Tennessee.	<b>Col. Harding vs.</b> <b>Gen. Wheeler.</b>	Conf.	U. S.	16	60	150	400
<b>Drury's Bluff.</b>	May 15, 1862.	Virginia.	<b>Gen. Beauregard vs.</b> <b>Gen. Butler.</b>	Conf.	Conf.	422	2,380	514	1,086
<b>Drop Mountain.</b>	Nov. 6, 1863.	West Virginia.	<b>Gen. Wm. W. Averell vs.</b> <b>Gen. John Echols.</b>	Conf.	U. S.	41	79	82	158
<b>Dunn's Bayou.</b>	May 5, 1864.	Louisiana.	<b>Gen. Polignac vs.</b> <b>Gen. Nickerson.</b>	Conf.	Conf.	35	64	4	18
<b>Dursill's Bluff.</b>	Aug. 23, 1864.	Arkansas.		Conf.	Conf.	13	42	6	33
<b>Econochaca.</b>	Dec. 23, 1813.	Mississippi.	<b>Gen. F. L. Claiborne vs.</b> <b>Weatherford.</b>	Indians.	U. S.	1	6	30	0
<b>El Caney.</b>	July 1, 1898.	Cuba.	<b>Gen. Shafter vs.</b> <b>Gen. Vara de Rey.</b>	Spanish.	U. S.	88	356	120	400
<b>Elizabeth City.</b>	Feb. 10, 1862.	North Carolina.	<b>Burnside and Goldsborough vs. Gen. Wm.</b> <b>Gen. Jackson vs.</b>	Conf.	U. S.	2	2	4	10
<b>Enuefu.</b>	Jan. 22, 1814.	Creek Nation.	<b>Monahoe.</b>	Indians.	U. S.	20	75	22†	0
<b>Enoree Ford.</b>	Nov. 20, 1780.			English.	U. S.	3	4	92	102
<b>Enotachopco.</b>	Jan. 24, 1814.	Creek Nation.	<b>Gen. Jackson.</b>	Indians.	U. S.	40	60	200†	0
<b>Enterprise—Baser.</b>	Sept. 5, 1813.	Penguin Point.	<b>Lt. Wm. Burrows vs.</b> <b>Capt. Samuel Birnie.</b>	English.	U. S.	2	10	4	17
<b>Enterprise—Tripoli.</b> <b>Essex—Alert.</b>	Aug. 1, 1801. Aug. 13, 1812.	Malta. North Atlantic.	<b>Lt. Andrew Sterett (U.S.)</b> <b>Capt. David Porter vs.</b> <b>Capt. Thomas Ingraham</b>	Tripolitan. English.	U. S. U. S.	0 0	0 0	20 0	30 3
<b>Essex—Phoebe and Cherub.</b>	March 28, 1814.	Valparaiso.	<b>Capt. Hillyar vs.</b> <b>Capt. David Porter.</b>	English.	Eng.	58	60	5	10
<b>Eutaw Springs.</b>	Sept. 5, 1781.	South Carolina.	<b>Gen. Greene vs.</b> <b>Col. Stuart.</b>	English.	U. S.	130	349	85	402
<b>Kara Chapel.</b>	July 23, 1864.	Georgia.	<b>Gen. Howard vs.</b> <b>Gen. Hood.</b>	Conf.	U. S.	99	601	564	3,778
<b>Fair Oaks.</b>	Oct. 27-28, 1864.	Virginia.	<b>Gen. McCulloch vs.</b> <b>Gen. Johnston.</b>	Conf.	*	120	783	150	801

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATIONS	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPOSERS	
						Killed	Wounded	Killed	Wounded
Falling Waters.	July 14, 1863.	Maryland.	Gen. Buford and Gen. Kilpatrick vs. Gen. Lee.	Conf.	U. S.	25	80	125	354
Falmouth.	Feb. 26, 1863.	Va.-Ky.	Conf. Conf.	Conf.	Conf.	15	81	6	8
Farragut at Vicksburg.	June 26, 1862.	Mississippi.	Com. David Farragut.	Conf.	U. S.	15	30	0	0
Farragut at Mobile.	Aug. 5, 1864.	Alabama.	Admiral David Farragut (U. S.) vs. Admiral Franklin Buchanan.	Conf.	U. S.	145	170	12	20
Farmington.	Oct. 7, 1863.	Mississippi-Missouri.	Conf.	Conf.	U. S.	8	16	22	37
Fayetteville.	April 18, 1863.	Arkansas.	Col. M. La Rue Harrison vs. Gen. Cabell.	Conf.	U. S.	4	26	17	36
Fife Forks.	April 1, 1865.	Virginia.	Gen. Sheridan vs. Gen. Lee.	Conf.	U. S.	124	706	450	750
Fort Blakely.	April 9, 1865.	Alabama.	Gen. Steele vs. Gen. Liddell.	Conf.	U. S.	113	516	242	874
Fort Blunt.	May 20, 1863.	Missouri.	Conf.	Conf.	U. S.	12	38	25	87
Fort Bowyer.	Sept. 16, 1814.	Missouri.	Maj. Wm. Lawrence (U. S.).	English.	U. S.	4	5	32	40
Fort Davidson.	Sept. 27, 1864.	Missouri.	Gen. Price (Conf.).	Conf.	Conf.	47	154	245	758
Fort Donelson.	Feb. 15, 1862.	Tennessee.	Gen. Grant vs. Gen. Floyd, Gen. Pillow and Gen. Buckner.	Conf.	U. S.	560	746	456	1,534
Fort Erie.	Aug. 15, 1814.	Canada.	Gen. Gaines vs. Col. Drummond, Fischer and Scott.	English.	U. S.	17	56	222	309
Fort Erie (Sortie).	Sept. 17, 1814.	Canada.	Gen. A. J. Smith vs. Gen. Richard Taylor.	English.	U. S.	79	216	110	250
Fort De Russy.	March 12, 1864.	Louisiana.	Conf.	Conf.	U. S.	18	29	14	33
Fort Fisher.	Dec. 24-25, 1864.	North Carolina.	Gen. Whiting vs. Adm. Porter and Gen. Butler.	Conf.	Conf.	20	63	3	55
Fort Fisher.	Jan. 13-15, 1865.	North Carolina.	Adm. Porter, Gen. Terry vs. Gen. Whiting and Col. Lamb.	Conf.	U. S.	184	749	150	249
Fort George.	May 27, 1813.	Canada.	Gen. Boyd and Col. Miller vs. Col. Vincent.	English.	U. S.	39	121	108	163
Fort Gregg and Alexander.	April 2, 1865.	Virginia.	Gen. Ord vs. Gen. Lee.	Conf.	U. S.	198	304	249	353
Fort Harrison.	Sept. 5, 1812.	Indiana.	Capt. Zachary Taylor vs. Indiana.	Conf.	U. S.	2	2	8	20
Fort Hatteras.	Aug. 28, 1861.	North Carolina.	Gen. Butler and Com. Stringham vs. Com. Harro.	Conf.	U. S.	0	0	4	25
Fort Henry.	Feb. 6, 1862.	Tennessee.	Gen. Grant and Com. Foote vs. Gen. Tilghman.	Conf.	U. S.	17	27	5	11
Fort Macon.	April 25, 1862.	North Carolina.	Gen. Parke vs. Col. W. H. T. W.	Conf.	U. S.	0	3	7	18
Fort McAllister.	March 3, 1863.	Georgia.	Gen. Hazen vs. Admiral Du Pont.	Conf.	Conf.	0	1	0	1
Fort Mcs.	May 5, 1813.	Ohio.	Gen. Harrison vs. Gen. Proctor and Tecumseh.	English.	U. S.	64	124	301	601
Fort Montgomery and Clinton.	Oct. 6, 1777.	New York.	Col. Campbell and Sir Henry Clinton vs. Gov. Clinton.	English.	Eng.	54	166	62	141
Fort Pemberton.	March 11-10, 1863.	Mississippi.	Lt. F. S. Sheppard vs. Lt.-Com. Watson Smith.	Conf.	Conf.	7	19	31	81
Fort Pillow.	May 10, 1862.	Tennessee.	Com. Walke and Com. Starnes vs. Mr. Montgomery.	Conf.	U. S.	0	4	2	1
Fort Pillow.	April 12, 1864.	Tennessee.	Gen. Forrest vs. Maj. Bradford.	Conf.	Conf.	348	52	19	61
Fort Pulaski.	April 11, 1862.	Georgia.	Col. Olmsted vs. Gen. Hunter.	Conf.	Conf.	1	3	1	7
Fort Ridgely.	Oct. 17, 1862.	Minnesota.	Conf.	Conf.	U. S.	1	6	44	108
Fort Schuyler.	Aug. 6, 1777.	New York.	St. Leger vs. Col. Gansevoort.	English.	Eng.	120	268	86	204
Fort Smith.	July 27, 1864.	Arkansas.	Lt. Burgeyne (U. S.).	Conf.	Conf.	10	15	12	19
Fort Steadman.	March 25, 1865.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	68	337	134	608
Fort Stephenson.	Aug. 2, 1813.	Ohio.	Maj. Croghan vs. Gen. Proctor.	English.	U. S.	1	7	50	101
Fort Wagner.	July 18, 1863.	South Carolina.	Gen. Gilmore vs. Col. Ketis.	Conf.	Conf.	624	876	26	74
Fort Wessels.	April 17, 1864.	Goldsbrough.	Conf.	Conf.	Conf.	20	31	29	42
Foster's Expedition (ended).	Dec. 18, 1862.	North Carolina.	Gen. Foster (U. S.).	Conf.	Conf.	90	475	201	538
Fox-Lapping.	Jan. 6, 1813.	Louisiana.	Conf.	Conf.	U. S.	1	3	14	8
Franklin.	April 10, 1863.	Tennessee.	Gen. Taylor.	Conf.	U. S.	17	30	79	163
Franklin.	Nov. 30, 1864.	Virginia.	Gen. Hood vs. Gen. Schofield.	Conf.	U. S.	189	1,033	1,141	5,112
Fredericksburg.	Dec. 11-13, 1862.	Virginia.	Gen. Lee vs. Gen. A. E. Burnside.	Conf.	Conf.	1,152	9,101	505	4,061
Frenchtown.	Jan. 18, 1813.	Michigan.	Gen. Proctor and Chiefs Boushhead and Spilllog vs. Gen. Winchester.	English.	U. S.	12	55	301	501
Frenchtown No. 2.	Jan. 22, 1813.	Michigan.	English.	Eng.	Eng.	357	84	150	155
Front Royal.	May 23, 1862.	Virginia.	Gen. E. S. Ewell vs. Gen. John W. Geary.	Conf.	Conf.	32	122	0	13
Gaines Mill.	June 27, 1862.	Virginia.	Gen. A. Klee vs. Gen. F. J. Porter.	Conf.	Conf.	3,000	4,500	2,000	4,000
Galveston.	Jan. 1, 1863.	Texas.	Gen. J. B. Magruder vs. Col. I. S. Burdell.	Conf.	Conf.	17	201	26	117
Gen. Armstrong—Queen.	Sept. 7, 1813.	Demerara River.	Capt. Guy R. Champlin (U. S.).	English.	U. S.	0	1	10	19

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPOSITES	
						Killed	Wounded	Killed	Wounded
<i>Gen. Armstrong—British boats.</i>	Sept. 26, 1814.	Fayal Roads.	<i>Capt. Samuel Reid vs. Lt. Wm. Masterlee.</i>	English.	U. S.	2	7	137	107
<i>Gen. Pickens—Achilles.</i>	June 4, 1780.	Bilboa, Spain.	<i>Capt. Jonathan Marden (U. S.).</i>	English.	U. S.	1	3	8	12
<i>Gen. Sturgis.</i>	June 10, 1864.	Guntown, Miss.	<i>Gen. Forrest vs. Gen. Sturgis.</i>	Conf.	U. S.	8	32	16	49
<i>Gen. Wayne.</i>	Sept. 21, 1777.			English.	Eng.	94	182	2	5
<i>Gen. Laite—Oranien.</i>	Feb. 18, 1814.			English.	Eng.	2	6	0	1
<i>Germanstown.</i>	Oct. 4, 1777.	Pennsylvania.	<i>Gen. Howe vs. Gen. Washington.</i>	English.	Eng.	189	542	98	402
<i>Gettysburg.</i>	July 1-3, 1863.	Pennsylvania.	<i>Gen. George G. Meade vs. Gen. Lee.</i>	Conf.	U. S.	2,834	13,709	4,000	14,000
<i>Glasgow.</i>	April 7, 1776.	Long Island.	<i>Capt. Tryingham Howe vs. Richard Moon vs. Capt. Esch Hopkins.</i>	English.	Eng.	10	14	1	3
<i>Globe—packets.</i>	Nov. 8, 1812.	Madison.	<i>Capt. J. Grant (U. S.).</i>	English.	U. S.	5	18	9	15
<i>Globe—Sir Simon Clark.</i>	Sept. 25, 1812.	North Atlantic.	<i>Adm. David Porter vs. Lt. W. C. R. Finch (U. S.).</i>	English.	U. S.	2	1	4	4
<i>Guerrero Tompkins—Mary Ann.</i>	April 29, 1863.	Mississippi.	<i>Adm. David Porter vs. Col. Wade.</i>	Conf.	Conf.	19	57	8	16
<i>Great Bridge.</i>	Dec. 15, 1775.	Virginia.	<i>Col. Woodford vs. Lord Dunmore.</i>	English.	U. S.	0	0	24	81
<i>Guaymas.</i>	Nov. 17, 1847.			Mexican.	U. S.	0	0	12	18
<i>Guerrero—Mashouda.</i>	June 17, 1815.	Mediterranean.	<i>Capt. Stephen Decatur (U. S.).</i>	Algerie.	U. S.	3	11	12	18
<i>Gulford Court-House.</i>	March 15, 1781.	North Carolina.	<i>Lord Cornwallis vs. Gen. Greene.</i>	English.	Eng.	123	314	231	318
<i>Gum Swamp.</i>	May 22, 1863.	North Carolina.	<i>Col. J. Richter Jones.</i>	Conf.	U. S.	3	8	4	16
<i>Hancock—Fox.</i>	May 11, 1777.	Boston.	<i>Capt. John Manly vs. Capt. Fotheringham.</i>	English.	U. S.	3	5	14	18
<i>Hanover Court-House.</i>	May 27, 1862.	Virginia.	<i>Gen. Fitz-John Porter vs. Gen. Branch.</i>	Conf.	U. S.	53	344	198	732
<i>Harlem Plains.</i>	Sept. 16, 1776.	New York.	<i>Maj. Leitch and Col. Knowlton (U. S.).</i>	English.	*	7	8	2	30
<i>Harper's Ferry.</i>	Sept. 13, 1863.	West Virginia.	<i>Gen. Jackson vs. Col. Miles.</i>	Conf.	Conf.	80	120	0	0
<i>Harrisonburg.</i>	June 5, 1862.	Virginia.	<i>Gen. Bayard and Col. Cluseret.</i>	Conf.	U. S.	15	32	20	50
<i>Harrison.</i>	Oct. 1, 1864.	Missouri.	<i>Gen. John H. Morgan vs. Col. Moore.</i>	Conf.	U. S.	8	24	16	46
<i>Hartsville.</i>	Dec. 7, 1862.	Tennessee.	<i>Col. Merrill vs. Gen. Marmaduke.</i>	Conf.	Conf.	48	102	35	115
<i>Hartsville.</i>	Jan. 10, 1863.	Missouri.	<i>Gen. Lee vs. Gen. Warren and Gen. Parke.</i>	Conf.	U. S.	7	69	18	74
<i>Hatcher's Run.</i>	Oct. 27, 1864.	Virginia.	<i>Capt. Seammes vs. Capt. Blake.</i>	Conf.	Conf.	2	6	0	1
<i>Hatteras—Alabama.</i>	Jan. 11, 1863.	Galveston, Tex.	<i>Capt. J. F. Williams vs. Capt. Sims.</i>	English.	U. S.	3	5	13	20
<i>Hazard—Active.</i>	March 16, 1779.	St. Thomas.	<i>Capt. F. Le Chartier (U. S.).</i>	English.	U. S.	0	7	2	11
<i>Hazard—Caledonia.</i>	Feb. 22, 1812.		<i>Mr. John Foster Williams.</i>	English.	U. S.	2	4	31	64
<i>Hazard—Admiral Duff.</i>	July 9, 1780.	North Atlantic.	<i>Gen. Prentiss vs. Gen. Holmes.</i>	Conf.	U. S.	98	152	205	504
<i>Helena.</i>	July 4, 1863.	Arkansas.	<i>Gen. Mower vs. Col. Vincent.</i>	Conf.	U. S.	1	3	5	18
<i>Henderson's Hill.</i>	March 21, 1864.	Louisiana.	<i>Capt. John O'Brien vs. Lt. Chien.</i>	English.	*	1	3	3	9
<i>Hibernia—brig of war.</i>	June 25, 1779.	North Atlantic.							
<i>Higby—Caledonia.</i>	July 22, 1812.			English.	U. S.	0	7	3	9
<i>Higby—Pocivora.</i>	Feb. 17, 1813.	West Indies.	<i>Capt. J. Grant (U. S.).</i>	English.	U. S.	1	3	0	0
<i>Hillabeetown.</i>	Nov. 18, 1813.	Creek Nation.	<i>Gen. White.</i>	Indians.	U. S.	0	0	61	0
<i>Hobkirk's Hill.</i>	April 25, 1781.	South Carolina.		English.	Eng.	52	141	38	104
<i>Holker—brig.</i>	July 30, 1779.		<i>Capt. M. Lawler (U. S.).</i>	English.	U. S.	6	16	6	20
<i>Holker—Hypocrite.</i>	Feb. 17, 1781.		<i>Capt. E. Keen (U. S.).</i>	English.	U. S.	3	1	4	7
<i>Holly Springs.</i>	Dec. 20, 1862.	Mississippi.	<i>Gen. Van Dorn vs. Col. Murphy.</i>	Conf.	Conf.	3	4	2	21
<i>Honey Hill.</i>	Nov. 30, 1864.	South Carolina.		Conf.	Conf.	66	645	18	114
<i>Honey Springs.</i>	July 17, 1863.	Indian Territory.	<i>Gen. Blunt vs. Gen. Cooper.</i>	Conf.	U. S.	17	60	153	378
<i>Horne—Pawcock.</i>	Feb. 24, 1813.	Demarara, S. A.	<i>Master-Com. Lawrence vs. Capt. Wm. Ivake.</i>	English.	U. S.	1	4	5	33
<i>Horne—Penguin.</i>	March 23, 1815.	Tristan d'Acunha.	<i>Capt. Middle vs. Capt. James Dickinson.</i>	English.	U. S.	1	11	10	28
<i>Horneshoe Bend.</i>	March 27, 1814.	Creek Nation.	<i>Gen. Jackson.</i>	Indians.	U. S.	26	106	557	0
<i>Hunter—Armed Ship.</i>	April 14, 1779.	North Atlantic.	<i>Capt. J. Douglas (U. S.).</i>	English.	*	0	4	3	6
<i>Huntersville.</i>	Jan. 8, 1862.	West Virginia.	<i>Maj. Geo. Webster vs. Capt. Hoge.</i>	Conf.	*	1	3	2	4
<i>Hyder Ally—Gen. Monk.</i>	April 8, 1782.	Cape May Roads.	<i>Lt. Joshua Barney vs. Capt. Rodgers.</i>	English.	U. S.	4	11	20	33
<i>Importation—Harlem.</i>	July 6, 1779.	North Atlantic.	<i>Capt. J. Young (U. S.).</i>	English.	U. S.	0	1	8	3
<i>Indiana—brig.</i>	Feb. 24, 1863.	Mississippi.	<i>Lt.-Com. Brown.</i>	Conf.	U. S.	1	1	2	3
<i>Industry—brig.</i>	Nov. 16, 1776.		<i>Capt. Child (U. S.).</i>	English.	U. S.	2	6	3	8
<i>Interpol.</i>	March 19, 1776.		<i>Capt. Child (U. S.).</i>	English.	Eng.	0	2	3	6
<i>Ireneade at Charleston.</i>	Sept. 4, 1864.	Tripoli.	<i>Master-Com. Richard Somers.</i>	Tripoli.	Tripoli.	13	0	20	30
			<i>Admiral Dupont and Gen. Hunter vs. Gen. Beauregard.</i>	Conf.	*	3	18	0	3
<i>Island No. 10.</i>	April 7, 1862.	Mississippi River.	<i>Gen. Pope and Com. Foote vs. Gen. Mackall.</i>	Conf.	U. S.	19	32	1	3
<i>Iuka.</i>	Sept. 19, 1862.	Mississippi.	<i>Gen. Rosecrans vs. Gen. Price.</i>	Conf.	U. S.	144	595	385	692

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPOSITES	
						Killed	Wounded	Killed	Wounded
<b>Jackson.</b>	July 12, 1863.	Mississippi.	Gen. Sherman vs. Gen. Johnston.	Conf.	U. S.	88	768	71	504
<b>Jackson.</b>	May 14, 1863.	Mississippi.	Gen. Sherman vs. Gen. McPherson.	Conf.	U. S.	47	228	64	392
<b>Jamestown Island.</b>	July 16, 1863.	South Carolina.		Conf.	U. S.	24	79	49	182
<b>Jamestown Island.</b>	July 6, 1781.			Eng.	Eng.	37	81	21	49
<b>Jason—Perrus.</b>	Nov. 1, 1779.	Newfoundland.	Capt. Manly (U. S.)	English.	Eng.	18	12	7	9
<b>Jason—Perrus.</b>	July 25, 1779.	New York.	Capt. Manly (U. S.)	English.	U. S.	1	3	3	6
<b>Jenkins's Ferry.</b>	April 30, 1864.	Arkansas.	Gen. Steele (U. S.)	Conf.	U. S.	222	978	842	1,458
<b>Jonesboro.</b>	Aug. 31—Sept. 1, 1864.	Georgia.	Gen. Sherman vs. Gen. Hardee.	Conf.	U. S.	6	1,149	498	1,608
<b>Julia—Gloucester.</b>	July 31, 1812.	Thousand Islands.	Midshipman Henry Wells (U. S.)	English.	U. S.	0	0	0	3
<b>Kearneys—Alabama.</b>	June 19, 1864.	Cherbourg.	Capt. John A. Winslow vs. Capt. Semmes.	Conf.	U. S.	1	3	9	21
<b>Kellar's Bridge.</b>	June 10, 1864.	Kentucky.		Conf.	U. S.	13	54	0	0
<b>Kelly's Ford.</b>	March 18, 1863.	Virginia.	Gen. Averill vs. Gen. Pitts Hugh Lee.	Conf.	U. S.	24	80	23	28
<b>Kemp—merchantsmen (armed).</b>	Dec. 3, 1815.	North Atlantic.	Capt. Jacobs (U. S.)	English.	U. S.	1	4	3	8
<b>Kernstown.</b>	March 23, 1862.	Virginia.	Gen. Schlessel vs. Gen. Jackson.	Conf.	U. S.	103	441	80	343
<b>King's Mountain.</b>	Oct. 7, 1780.	South Carolina.	Coleman Campbell, Shelby and Cleveland vs. Maj. Ferguson.	English.	U. S.	28	60	168	284
<b>Kingsion.</b>	Dec. 14, 1862.	Tennessee.		Conf.	U. S.	90	478	71	268
<b>Kirkville.</b>	Aug. 6, 1862.	Missouri.	Col. McNeill vs. Porter.	Conf.	U. S.	28	60	180	498
<b>Knoxville.</b>	Nov. 17, 1863.	Tennessee.	Gen. Burnside vs. Gen. Longstreet.	Conf.	U. S.	24	72	13	64
<b>Knoxville.</b>	Nov. 29, 1863.	Tennessee.	Gen. Burnside vs. Gen. Longstreet.	Conf.	U. S.	24	68	250	432
<b>La Colle Mill.</b>	March 30, 1814.	Canada.	Maj. Hancock vs. Gen. Wilkinson.	English.	Eng.	8	66	11	47
<b>Lady Washington—barges.</b>	June 3, 1776.	Boston.	Capt. Cunningham (U. S.)	English.	U. S.	0	2	3	11
<b>Lake Borgne.</b>	Dec. 14, 1814.	Louisiana.	Adm. Sir Alexander Cochrane vs. Lt. Thomas Jones.	English.	Eng.	6	35	17	77
<b>Lake Champlain.</b>	Oct. 11, 1776.	New York.	Capt. Frisbie vs. Gen. Benedict Arnold.	English.	Eng.	30	50	15	36
<b>Lake Champlain.</b>	Sept. 11, 1814.	New York.	Gen. Macdonough vs. Capt. Pring.	English.	U. S.	83	58	84	110
<b>Lake Erie.</b>	Sept. 10, 1813.	Western end of lake.	Conf. Perry vs. Conf. Barclay.	English.	U. S.	27	96	41	94
<b>Lake Ontario.</b>	Sept. 28, 1813.	Cuba.	Gen. Wheeler vs. Gen. Linares.	English.	U. S.	10	17	12	20
<b>Las Guasimas.</b>	June 24, 1898.			Spanish.	U. S.	16	50	28	124
<b>Lawrence.</b>	Aug. 21, 1862.	Kansas.	Col. Quantrell (Conf.)	Conf.	Conf.	140	22	3	14
<b>Lebanon.</b>	July 8, 1862.	Kentucky.	Gen. Morgan vs. Col. Hanson.	Conf.	Conf.	4	8	3	4
<b>Lee—ship.</b>	Nov. 29, 1775.	Cape Ann.	Capt. John Manly (U. S.)	English.	U. S.	1	3	2	8
<b>Legareville.</b>	July 7, 1864.	South Carolina.		Conf.	Conf.	36	61	12	28
<b>Lewisburg.</b>	May 23, 1862.	Virginia.	Col. Crook vs. Gen. Heath.	Conf.	U. S.	11	52	49	76
<b>Lexington.</b>	April 19, 1775.	Massachusetts.	Maj. Buttrick vs. Col. Smith and Lord Percy	English.	Eng.	7	9	0	0
<b>Lexington—Alert.</b>	Sept. 20, 1777.	Morlaix.	Lt. Bazel vs. Capt. Henry Johnston.	English.	Eng.	3	10	2	3
<b>Lexington—Edward.</b>	April 17, 1776.	Capes of Virginia	Capt. John Barry vs. Lt. Boucher.	English.	U. S.	2	2	51	81
<b>Lexington.</b>	Sept. 12, 1861.	Missouri.	Col. Mulligan.	Conf.	U. S.	42	108	33	65
<b>Lexington, Red River.</b>	April 12, 1864.	Arkansas.	Gen. Steele vs. Gen. Holmes.	Conf.	U. S.	0	0	164	341
<b>Little Rock.</b>	Sept. 10, 1863.	Arkansas.		Conf.	U. S.	22	59	31	43
<b>London, Ky.</b>	Aug. 17, 1862.	Kentucky.		Conf.	Conf.	12	15	3	8
<b>Long Island.</b>	Aug. 27, 1776.	New York.	Gen. Howe vs. Gen. Washington.	English.	Eng.	62	158	61	257
<b>Lottery—boats.</b>	Feb. 14, 1813.	Chesapeake Bay.	Lt. Kelly Naser vs. Capt. John Southcomb.	English.	Eng.	8	10	2	4
<b>Lyneburg.</b>	June 17-18, 1864.	Virginia.	Conf. Early vs. Gen. Hunter.	Conf.	Conf.	99	503	47	187
<b>Maguaga.</b>	Aug. 9, 1812.	Michigan.	Col. Miller vs. Tecumseh.	English.	U. S.	18	58	50	75
<b>Major Montgomery.</b>	Aug. 6, 1862.	Dodd Co., Mo.	Maj. Montgomery vs. Col. Collins.	Conf.	Conf.	14	40	0	2
<b>Malvern Hill.</b>	July 1, 1862.	Virginia.	Gen. McClellan vs. Gen. Lee.	Conf.	U. S.	2,860	3,500	3,023	4,077
<b>Malvern Hill No. 2.</b>	Aug. 4, 1862.	Virginia.	Col. Averill vs. 11th Virginia Cavalry.	Conf.	U. S.	6	8	10	18
<b>Manassas Gap.</b>	July 24, 1863.	Virginia.	Gen. Meade vs. Gen. Lee.	Conf.	U. S.	30	59	41	70
<b>Manassas Junction.</b>	Aug. 27, 1862.	Virginia.	Gen. Jackson vs. Gen. Pope.	Conf.	Conf.	14	28	11	16
<b>Manila.</b>	May 1, 1898.	Manila Bay.	Admiral Dewey vs. Admiral Montojo.	Spanish.	U. S.	0	7	318	296
<b>Manila.</b>	Aug. 13, 1898.	Philippine Is.	Admiral Montojo.	Spanish.	U. S.	8	40	100	100
<b>Manzanillo.</b>	Aug. 12, 1898.	Philippine Is.	Gen. Merritt.	Spanish.	U. S.	0	0	100	100
<b>Marine—Lady Sherlock.</b>	Aug. 10, 1812.	Nantucket Shoals.	Capt. Ordronaux.	English.	U. S.	0	0	0	1
<b>Mark's Mills.</b>	April 25, 1864.	Arkansas.	Gen. Shelby vs. Col. Drake.	Conf.	Conf.	98	142	128	394
<b>Marksville.</b>	May 16, 1864.	Louisiana.	Capt. Y. Taylor vs. Capt. Irvine.	Conf.	U. S.	9	18	32	64
<b>Mary—Active.</b>	Aug. 20, 1779.			English.	U. S.	0	3	2	7



## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPONENTS	
						Killed	Wounded	Killed	Wounded
<b>Martinsburg.</b>	July 23-24, 1864.	West Virginia.	Gen. Early vs. Gen. Averell and Gen. Crook. Capt. D. Souther (U. S.)	Conf.	U. S.	342	836	26	152
<i>Massachusetts—Lounsdale.</i>	Dec. 2, 1777.			English.	U. S.	3	5	6	13
<i>Mathias Point.</i>	June 27, 1861.	Virginia.	Com. Ward and Lt. Chapin (U. S.)	Conf.	Conf.	1	4	0	0
<b>McDowell's.</b>	May 8, 1862.	Virginia.	Gen. Jackson vs. Gen. Milroy and Gen. Schenck.	Conf.	Conf.	80	176	71	390
<b>McMinnville.</b>	April 20, 1863.	Tennessee.	Gen. Reynold vs. Gen. Wheeler.	Conf.	U. S.	0	0	4	8
<b>Mechanicville.</b>	June 26, 1862.	Virginia.	Gen. McClellan vs. Gen. Jackson.	Conf.	U. S.	149	224	156	236
<i>Memphis.</i>	June 6, 1862.	Tennessee.	Admiral Davis (U. S.)	Conf.	U. S.	10	4	20†	30†
<i>Merrimac in Hampton Roads.</i>	March 8, 1862.	Virginia.	Admiral Franklin Buchanan vs. Lt. Upton Morris and Lt. J. B. Smith.	Conf.	Conf.	250	301	8	11
<b>Middle Creek.</b>	Jan. 7, 1862.	Kentucky.	Col. Garfield vs. Marshall.	Conf.	U. S.	3	8	11	22
<b>Middletown.</b>	June 12, 1863.	Virginia.	Col. Shaw (U. S.)	Conf.	U. S.	1	4	18	22
<b>Milkken's Bend.</b>	June 7, 1863.	Louisiana.	J. G. Walker.	Conf.	U. S.	154	223	148	294
<b>Mill Spring (Logan Cross Roads).</b>	Jan. 19, 1862.	Kentucky.	Gen. George H. Thomas vs. Gen. Zollicoffer.	Conf.	U. S.	39	207	192	132
<b>Mine Run (ended).</b>	Nov. 28, 1863.	Virginia.	Gen. Meade vs. Gen. Lee.	Conf.	U. S.	99	398	121	432
<b>Mingo Swamp.</b>	Feb. 3, 1863.	Missouri.	Maj. Reeder vs. Dan Meade.	Conf.	U. S.	0	0	8	20
<b>Missisnewa.</b>	Dec. 17, 1812.	Indiana.	Col. Campbell.	Indians.	U. S.	11	26	39	0
<b>Monk's Corner.</b>	April 14, 1780.			English.	Eng.	26	73	3	6
<i>Monitor—Merrimac.</i>	March 9, 1862.	Hampton Roads, Virginia.	Lt. J. L. Worden vs. Capt. Franklin Buchanan.	Conf.	U. S.	0	1	0	2
<b>Monmouth.</b>	June 28, 1778.	New Jersey.	Gen. Washington vs. Lord Cornwallis.	English.	U. S.	72	160	294	170
<b>Monocacy.</b>	July 9, 1864.	Maryland.	Gen. Early vs. Gen. Lee Wallace.	Conf.	Conf.	90	579	78	322
<b>Monterey.</b>	Sept. 24, 1846.	Mexico.	Gen. Taylor vs. Gen. Ampudia.	Mexican.	U. S.	142	364	200†	450
<i>Montgomery—armed ship.</i>	Dec. 6, 1812.	Surinam.	Capt. Upton (U. S.)	English.	U. S.	4	13	6	21
<b>Moore's Creek.</b>	Feb. 14, 1776.	North Carolina.	Col. Caswell and Col. Livingston vs. Col. McLeod.	English.	U. S.	0	3	13	22
<b>Moorefield.</b>	Aug. 30, 1814.	Maryland.	Col. Reed vs. Sir Peter Parker.	English.	U. S.	0	3	13	20
<b>Moravian Towns.</b>	Oct. 6, 1813.			English.	U. S.	7	22	80	101
<b>Monnt Washington.</b>	Nov. 16, 1776.	Kentucky.	Lt. Col. Van Treba vs. Col. Terry.	English.	Eng.	48	101	252	448
<b>Mumfordsville.</b>	Sept. 14, 1862.	Tennessee.	Gen. Buell.	Conf.	U. S.	15	22	29	21
<b>Murfreesboro.</b>	July 13, 1862.	Tennessee.	Gen. Forrest vs. Gen. Bragg.	Conf.	U. S.	33	62	47	103
<b>Murfreesboro.</b>	Dec. 30, 1862—Jan. 2, 1863.	Tennessee.	Gen. Rosternans vs. Gen. Bragg.	Conf.	U. S.	1,533	7,245	1,384	6,892
<b>Nashville.</b>	Dec. 15-16, 1864.	Tennessee.	Gen. Thomas vs. Gen. Hood.	Conf.	U. S.	299	1,741	554	3,021
<b>Near Baltimore.</b>	Sept. 13, 1814.	Maryland.		English.	Eng.	24	139	80	301
<b>Near Donaldsonville.</b>	June 28, 1863.	Louisiana.	Com. Woolsey vs. Gen. Green.	Conf.	Conf.	151	349	88	126
<b>Near New Orleans.</b>	Dec. 23, 1814.	Louisiana.		English.	Eng.	24	113	99	230
<b>Near New Orleans.</b>	Dec. 23, 1814.	Louisiana.		English.	U. S.	7	8	120	149
<b>Near Opelousa.</b>	Nov. 3, 1863.	Louisiana.		Conf.	U. S.	26	124	58	298
<b>Near Pomeroy.</b>	July 19, 1863.	Ohio.		Conf.	U. S.	8	12	41	41
<i>Near Tolouse.</i>	Oct. 25-26, 1846.	Mexico.	Capt. Perry (U. S.)	Mexican.	U. S.	0	7	20†	30†
<b>New Berne.</b>	March 14, 1862.	North Carolina.	Gen. Burnside vs. Gen. O. B. Brandt.	Conf.	U. S.	102	432	50	182
<b>New Bridge.</b>	May 24, 1862.	Virginia.	Col. Woodbury (U. S.)	Conf.	U. S.	3	5	4	15
<b>New Lisbon.</b>	July 26, 1863.	Ohio.	Gen. Morgan (Conf.)	Conf.	U. S.	1	12	22	45
<b>New London.</b>	Sept. 6, 1781.	Virginia.		English.	Eng.	88	34	86	142
<b>New Market Heights.</b>	Sept. 28-30, 1864.	Virginia.	Gen. Breckinridge vs. Gen. Sigel.	Conf.	U. S.	398	2,031	399	1,601
<b>New Market.</b>	May 15, 1864.	Virginia.		Conf.	Conf.	120	563	96	306
<b>New Orleans.</b>	Jan. 1, 1815.	Louisiana.		English.	U. S.	11	23	20	30†
<b>New Orleans.</b>	Jan. 8, 1815.	Louisiana.	Gen. Jackson vs. Gen. Pakenham.	English.	U. S.	4	13	700	1,400
<b>New Orleans.</b>	April 23, 1862.	Louisiana.	Adm. Farragut and Gen. E. F. Butler vs. Gen. Lovell and Gen. Duncan.	Conf.	U. S.	37	147	12	40
<b>Newtown.</b>	Aug. 29, 1779.	New York.	Gen. Sullivan vs. Johnson, Butler and Brandt.	Indians.	U. S.	8	22	12	34
<b>Niagara Batteries.</b>	Nov. 28, 1812.			English.	U. S.	8	12	14	30
<b>Niagara (Lundy's Lane).</b>	July 25, 1814.	Canada.	Gen. Scott, Gen. Brown and Gen. Ripley vs. Gen. Rial and Gen. Drummond.	English.	U. S.	171	572	201	559
<b>Ninety-six.</b>	June 18, 1811.	South Carolina.	Col. Cruger vs. Gen. Greene.	English.	Eng.	48	107	24	61
<i>Nonenuch—Privateer.</i>	Sept. 28, 1812.			English.	U. S.	3	8	7	16
<i>Norfolk—Picares.</i>	Oct. 31, 1799.	San Domingo.	Lt. William Bainbridge (U. S.)	Picares.	U. S.	0	0	65	70
<b>North Anna.</b>	May 26-27, 1864.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	223	1,460	304	1,513

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPOSITES	
						Killed	Wounded	Killed	Wounded
<b>Oak Grove, near Richmond.</b>	June 25, 1862.	Virginia.	Gen. McClellan vs. Gen. Hill and Gen. Huger.	Conf.	U. S.	51	401	60	300
<i>Off Charleston.</i>	Jan. 31, 1863.	South Carolina.	Adm. Du Pont.	Conf.	U. S.	23	24	0	0
<b>Ogdensburg.</b>	Oct. 4, 1812.	New York.	Fraser and McDonnell vs. Capt. Forsythe.	Conf. English.	U. S.	0	0	3	6
<b>Old River.</b>	Feb. 10, 1863.	Louisiana.	Capt. F. Tucker (U. S.)	Conf.	U. S.	8	7	4	7
<b>Olustee.</b>	Feb. 20, 1864.	Florida.	Gen. Finegan vs. Gen. Seymour.	Conf.	Conf.	193	1,175	160	350
<b>Operations at Mine Run.</b>	Nov. 26-27, 1863.	Virginia.	Gen. Meade vs. Gen. Lee.	Conf.	U. S.	.....	.....	.....	.....
<b>Opequan.</b>	Sept. 19, 1864.	Virginia.	Gen. Sheridan vs. Gen. Early.	Conf.	U. S.	653	2,710	1,632	3,868
<b>Oswego.</b>	May 6, 1814.	New York.	Gen. Drummond vs. Col. Mitchell.	English.	U. S.	6	38	70	165
<b>Palo Alto.</b>	May 8, 1846.	Mexico.	Gen. Taylor vs. Gen. Arista.	Mexican.	U. S.	4	42	102	127
<b>Parker's Cross-Roads.</b>	Dec. 31, 1862.	Tennessee.	Col. C. L. Dunham vs. Gen. Forrest.	Conf.	U. S.	23	139	48	152
<b>Paterson Creek.</b>	Feb. 9, 1864.	West Virginia.	Gen. Rosser (Conf.)	Conf.	Conf.	0	31	4	51
<b>Paulus Hook.</b>	Aug. 18, 1870.	New Jersey.	Maj. Lee vs. Maj. Southard.	English.	U. S.	2	3	8	12
<i>Paul Jones—Hassan.</i>	Nov. 8, 1812.	North Atlantic.	Capt. J. Hazard (U. S.)	English.	U. S.	0	1	1	1
<i>Peacock—Esperance.</i>	April 29, 1814.	Florida.	Com. Lewis Warrington vs. Capt. Richard Wain.	English.	U. S.	0	2	8	15
<i>Peacock—Nautilus.</i>	June 20, 1815.	Straits of Bunda.	Capt. Warrington vs. Lt. Charles Boyce.	English.	U. S.	0	0	8	8
<b>Pea Ridge.</b>	March 6-8, 1862.	Arkansas.	Gen. Curtis and Gen. Franz Sigel vs. Gen. Van Dora.	Conf.	U. S.	203	972	1,040	3,638
<b>Peach Tree Creek.</b>	July 20, 1864.	Georgia.	Gen. Thomas vs. Gen. Hood.	Conf.	U. S.	301	1,411	880	3,916
<b>Perote.</b>	April 22, 1847.	Mexico.	Gen. Buell vs. Gen. Bragg.	Conf.	U. S.	0	3	0	4
<b>Perryville.</b>	Oct. 8, 1862.	Kentucky.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	916	2,943	980	1,530
<b>Petersburg.</b>	April 2, 1865.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	298	2,565	341	3,092
<b>Petersburg (from June 15).</b>	June 19, 1864.	Virginia.	Gen. Lee vs. Gen. Smith, Gen. Hancock and Gen. Burnside.	Conf.	U. S.	1,298	7,474	964	6,721
<b>Petersburg.</b>	June 30-30, 1864.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	112	506	801	1,417
<b>Petersburg (from July 1, exclusive of losses at the Crater and Deep Bottom).</b>	July 31, 1864.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	419	2,076	799	4,023
<b>Petersburg (Aug. 1 to Aug. 31).</b>	Aug. 31, 1864.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	87	484	101	608
<b>Petersburg (Sept. 1 to Oct. 30).</b>	Oct. 30, 1864.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	170	822	240	761
<i>Phœnix (frigate).</i>	Feb. 16, 1804.	Tripoli.	Lt. Stephen Decatur.	Tripolitans.	U. S.	0	1	1001	0
<b>Philadelphia.</b>	Oct. 20, 1863.	Tennessee.	Gen. Hunter vs. Gen. Imboden.	Conf.	Conf.	26	73	34	62
<b>Piedmont.</b>	June 6, 1864.	Virginia.	Gen. Hunter vs. Gen. Imboden.	Conf.	U. S.	130	680	633	2,337
<i>Pilgrim—Mary.</i>	Jan. 6, 1781.	North Atlantic.	Capt. J. Robinson vs. Capt. Stovards.	English	U. S.	4	16	13	22
<b>Pine Bluff.</b>	Oct. 25, 1863.	Arkansas.	Col. Clayton vs. Gen. Prentiss.	Conf.	U. S.	17	40	39	111
<b>Pineville.</b>	Aug. 13, 1863.	Missouri.	Gen. Marmaduke.	Conf.	U. S.	3	18	28	92
<b>Pittsburg Landing.</b>	April 6-7, 1862.	Tennessee.	Gen. Grant vs. Gen. Johnston and Gen. Beauregard.	Conf.	U. S.	1,735	7,862	1,128	8,012
<b>Plattsburg.</b>	Sept. 11, 1814.	New York.	Gen. Macomb vs. Gen. Taylor.	Conf.	U. S.	37	62	50	96
<b>Pleasant Hill.</b>	April 9-9, 1864.	Louisiana.	Gen. Taylor vs. Gen. A. J. Smith.	Conf.	U. S.	99	688	348	1,054
<b>Plymouth.</b>	April 30, 1864.	North Carolina.	Gen. Hoke vs. Lt. Charles W. Finner.	Conf.	Conf.	41	69	125	174
<b>Pocotaligo.</b>	Oct. 23-23, 1862.	South Carolina.	Lt. Charles W. Finner.	Conf.	Conf.	84	152	14	102
<b>Port Gibson.</b>	May 1, 1863.	Mississippi.	Gen. McChesney vs. Gen. Pemberton.	Conf.	U. S.	130	718	144	832
<i>Port Hudson.</i>	March 13, 1863.	Louisiana.	Adm. Farragut (U. S.)	Conf.	U. S.	8	7	0	0
<b>Port Hudson.</b>	June 14, 1863.	Louisiana.	Gen. Gardner vs. Gen. Banks.	Conf.	Conf.	250	680	188	364
<b>Port Hudson.</b>	May 27, 1863.	Louisiana.	Gen. Gardner vs. Gen. Banks.	Conf.	Conf.	293	1,549	110	173
<b>Port Republic.</b>	June 9, 1862.	Virginia.	Gen. Jackson vs. Gen. Tyler and Gen. Carroll.	Conf.	Conf.	67	361	104	796
<i>Port Royal.</i>	Nov. 7, 1861.	South Carolina.	Adm. Du Pont vs. Gen. Drayton.	Conf.	U. S.	8	23	11	48
<b>Prairie d'Anne.</b>	April 10, 1863.	Arkansas.	Gen. Blunt vs. Gen. Heron vs. Gen. Hindman.	Conf.	U. S.	8	15	18	36
<b>Prairie Grove.</b>	Dec. 7, 1862.	Arkansas.	Gen. Blunt vs. Gen. Heron vs. Gen. Hindman.	Conf.	U. S.	167	798	164	817
<b>Preble's Farm.</b>	Sept. 30-Oct. 1, 1864.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	141	788	214	686
<i>President—Bridgers.</i>	June 23, 1812.	Nantucket Shoals.	Capt. John Rodgers vs. Capt. Richard Byron.	English.	U. S.	3	19	2	22
<i>President—Endymion.</i>	Jan. 15, 1815.	Long Island.	Capt. Stephen Bessant vs. Capt. Henry Hope.	English.	Eng.	24	86	11	14
<i>Prince de Neuchâtel—Endymion.</i>	Oct. 9, 1814.	Nantucket.	Capt. J. Ordronaux vs. Capt. Henry Hope.	English.	U. S.	7	23	33	37
<b>Princeton.</b>	Jan. 3, 1777.	New Jersey.	Gen. Washington vs. Col. Mifflin.	English.	U. S.	31	64	49	151
<i>Prosperity—printer.</i>	Dec. 4, 1781.	St. Thomas.	Capt. Alexander Murray (U. S.)	English.	U. S.	3	8	4	9
<i>Protector—Admiral Duf.</i>	Jan. 9, 1779.	North Atlantic.	Capt. J. F. Williams vs. Capt. R. Strange.	English.	U. S.	1	3	140	8

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPONENTS	
						Killed	Wounded	Killed	Wounded
<i>Providence—Dispersed.</i>	May 7, 1779.	Boston.	<b>Capt. Hoisted Baker</b> vs. <b>Capt. Thomas Davy.</b>	English.	U. S.	4	10	8	19
<b>Puebla.</b>	May 16, 1847.	Mexico.	<b>Gen. Worth (U. S.)</b>	Mexican.	U. S.	18	62	83	142
<i>Quelito Batoo.</i>	Feb. 7, 1832.	Sumatra.	<b>Mr. Endicott (U. S.)</b>	Malaya.	U. S.	2	11	120†	200†
<b>Quebec.</b>	Dec. 31, 1775.	Canada.	<b>Gen. Carleton</b> vs. <b>Gen. Montgomery</b> and <b>Col. Arnold.</b>	English.	Eng.	18	42	1	8
<b>Queenstown.</b>	Oct. 13, 1812.	Canada.	<b>Gen. Brock</b> vs. <b>Gen. Van Rensselaer.</b>	English.	Eng.	90	160	80	101
<i>Raiding—Druid.</i>	Sept. 3, 1777.	40° 33' N. 50° 17' W.	<b>Capt. Thomas Thompson</b> vs. <b>Capt. Carteret.</b>	English.	U. S.	1	2	6	26
<i>Randolph—Yarmouth.</i>	March 7, 1778.	Barbadoes.	<b>Capt. Vincent</b> vs. <b>Capt. Nicholas Bridle.</b>	English.	Eng.	311	0	8	12
<i>Ranger—Drake.</i>	April 24, 1778.	Irish Sea.	<b>Capt. John Paul Jones</b> vs. <b>Capt. Burdon.</b>	English.	U. S.	2	6	13	24
<i>Ranger—privateer.</i>	Oct. 10, 1776.	North Atlantic.	<b>Capt. Hume (U. S.)</b>	English.	U. S.	3	11	16	24
<i>Rapids of Miami.</i>	May 5, 1813.	Virginia.	U. S.	English.	U. S.	80	101	15	45
<b>Rappahannock Station.</b>	Nov. 7, 1863.	Virginia.	<b>Conf.</b>	Conf.	U. S.	149	250	80	160
<b>Raymond.</b>	May 12, 1863.	Mississippi.	<b>Conf.</b>	Conf.	U. S.	69	341	103	720
<b>Ream's Station.</b>	Aug. 25, 1864.	Virginia.	<b>Gen. McPherson</b> vs. <b>Gen. A. P. Hill</b> vs. <b>Gen. Hancock.</b>	Conf.	*	127	546	289	1,211
<b>Red Bank.</b>	Oct. 22, 1777.	New Jersey	<b>Col. Greene</b> vs. <b>Col. Donop.</b>	English.	U. S.	11	21	142	258
<b>Red Hill.</b>	Jan. 14, 1865.	Louisiana.	<b>Gen. A. J. Smith</b> vs. <b>Gen. Taylor.</b>	Conf.	U. S.	7	27	14	36
<b>Red River.</b>	April 7, 1864.	Louisiana.	<b>Gen. A. J. Smith</b> vs. <b>Gen. Taylor.</b>	Conf.	U. S.	23	39	45	88
<b>Red River.</b>	April 26, 1864.	Louisiana.	<b>Gen. Sherman</b> vs. <b>Gen. Johnston.</b>	Conf.	U. S.	17	31	28	61
<b>Resaca.</b>	May 13, 1864.	Georgia.	<b>Gen. Sherman</b> vs. <b>Gen. Johnston.</b>	Conf.	U. S.	598	2,147	861	1,949
<b>Resaca de la Palma.</b>	May 9, 1847.	Mexico.	<b>Gen. Taylor</b> vs. <b>Gen. Arista.</b>	Mexican.	U. S.	39	83	160	228
<i>Revenge—Narcissus.</i>	March 29, 1813.	Kentucky.	<b>Gen. Kirby-Smith</b> vs. <b>Gen. Nelson.</b>	English.	Eng.	0	3	0	1
<b>Richmond.</b>	Aug. 30, 1862.	Kentucky.	<b>Conf.</b>	Conf.	U. S.	199	689	153	248
<b>Roanoke Island.</b>	Feb. 8, 1862.	North Carolina.	<b>Gen. Burnside</b> and <b>Gen. Goldsborough</b> vs. <b>Gen. Wise.</b>	Conf.	U. S.	47	198	25	30
<b>Rock House.</b>	Feb. 12, 1864.	Tennessee.	Conf.	Conf.	U. S.	3	5	18	23†
<b>Rogersville.</b>	Nov. 6, 1863.	North Atlantic.	<b>Capt. Barney</b> vs. <b>Capt. Moorson.</b>	Conf.	U. S.	8	12	3	24
<i>Rosie—Princess Amelia.</i>	Sept. 16, 1812.	North Atlantic.	<b>Conf.</b>	Conf.	U. S.	0	8	3	0
<i>Rover—Africa.</i>	Dec. 10, 1776.	North Atlantic.	<b>Capt. Forrester (U. S.)</b>	English.	U. S.	0	3	23	0
<i>Sabine Cross-Roads.</i>	April 8, 1864.	Louisiana.	<b>Gen. Taylor</b> vs. <b>Gen. Franklin.</b>	Conf.	Conf.	199	893	456	1,024
<i>Sabine Pass.</i>	Sept. 8, 1863.	Texas.	<b>Conf.</b>	Conf.	U. S.	17	19	0	0
<i>Sachem—privateer.</i>	Jan. 21, 1863.	Texas.	<b>Conf.</b>	Conf.	U. S.	1	3	2	6
<i>Sachem—privateer.</i>	July 6, 1776.	North Atlantic.	<b>Capt. Isalah Robinson</b> (U. S.)	English.	U. S.	1	3	2	6
<i>Sackett's Harbor.</i>	May 29, 1813.	Virginia.	<b>U. S.</b>	English.	U. S.	21	84	29	101
<b>Sailor's Creek.</b>	April 6, 1865.	Virginia.	<b>Gen. Sheridan</b> vs. <b>Gen. Ewell.</b>	Conf.	U. S.	166	1,014	268	2,032
<b>Sakelatchie.</b>	Feb. 3, 1865.	Conf.	U. S.	Conf.	U. S.	18	70	20	80
<i>Sally—transport.</i>	Dec. 21, 1779.	North Atlantic.	<b>Capt. J. Smith (U. S.)</b>	English.	U. S.	5	12	6	11
<b>San Blas.</b>	Jan. 12, 1848.	Lower California.	<b>Lt. Theodoros Bailey</b> (U. S.)	Mexican.	U. S.	0	2	3	8
<b>Sandy Creek.</b>	April 30, 1814.	California.	<b>Conf.</b>	Conf.	U. S.	1	3	13	28
<b>San Gabriel.</b>	Jan. 8, 1847.	California.	<b>Capt. Stockton</b> vs. <b>Gen. Flores.</b>	Mexican.	U. S.	2	9	70	156
<b>San Juan.</b>	July 1-3, 1898.	Cuba.	<b>Spanish.</b>	Spanish.	U. S.	151	1,007	204	1,340
<b>San José.</b>	Feb. 16, 1848.	Lower California.	<b>Com. Du Pont (U. S.)</b>	Mexican.	U. S.	3	8	13	30†
<b>San José.</b>	Nov. 21, 1847.	Lower California.	<b>Lt. Heywood (U. S.)</b>	Mexican.	U. S.	0	3	8	20
<b>Santiago.</b>	July 10-12, 1898.	Cuba.	<b>Gen. Shafter.</b>	Spanish.	U. S.	2	13	0	0
<i>Santiago forte bombarded.</i>	June 22, 1898.	Cuba.	<b>Adm. Sampson.</b>	Spanish.	*	1	11	(7)	(7)
<b>Saratoga.</b>	Oct. 7, 1777.	New York.	<b>Gen. Gates</b> vs. <b>Gen. Burgoyne.</b>	English.	U. S.	32	61	98	156
<b>Saratoga—Chance.</b>	Dec. 22, 1778.	North Atlantic.	<b>Capt. Murray (U. S.)</b>	English.	U. S.	4	9	5	13
<b>Saratoga—Molly.</b>	Oct. 8, 1780.	North Atlantic.	<b>Capt. James Young</b> (U. S.)	English.	U. S.	2	4	6	10
<b>Saratoga—Morgiana.</b>	Dec. 10, 1812.	La Guayra.	<b>Capt. Charles W. Wooster</b> vs. <b>Capt. Cunningham.</b>	English.	U. S.	3	7	2	5
<i>Saucy Jack—Pelham.</i>	April 30, 1814.	Cape Nicola Mole.	<b>Capt. Chazal</b> vs. <b>Capt. Boyd.</b>	English.	U. S.	2	9	4	11
<i>Saucy Jack—Sherbroke.</i>	Nov. 10, 1813.	San Domingo.	<b>U. S.</b>	English.	U. S.	0	3	2	5
<i>Saucy Jack—troop ship.</i>	Oct. 31, 1814.	San Domingo.	<b>Capt. Chazal</b> vs. <b>Lt. Price.</b>	English.	U. S.	8	15	3	2
<b>Savannah.</b>	Dec. 29, 1778.	Georgia.	<b>Col. Campbell</b> vs. <b>Gen. Robert Howe.</b>	English.	Eng.	28	69	7	19
<b>Savannah.</b>	Oct. 8, 1779.	Georgia.	<b>Gen. Prevost</b> and <b>Count D'Eating</b> and <b>Gen. Lincoln.</b>	English.	Eng.	98	136	20	35
<b>Scottsboro.</b>	Jan. 10, 1865.	South Carolina.	<b>Conf.</b>	Conf.	U. S.	1	8	14	32
<b>Secessionville.</b>	June 16, 1862.	South Carolina.	<b>Col. T. G. La Mar</b> vs. <b>Gen. Sherman.</b>	Conf.	Conf.	137	438	63	141
<b>Seima.</b>	April 2, 1865.	Alabama.	<b>Gen. Wilson</b> vs. <b>Gen. Forrest.</b>	Conf.	U. S.	153	347	198	409
<b>Seven Pines, or Fair Oaks.</b>	May 31, 1862.	Virginia.	<b>Conf.</b>	Conf.	*	891	3,627	1,987	2,233
<b>Shelbyville.</b>	June 27, 1863.	Tennessee.	<b>Gen. McClellan</b> vs. <b>Gen. Rosecrans</b> vs. <b>Gen. Bragg.</b>	Conf.	U. S.	143	361	164	346
<b>Shepardstown.</b>	July 15, 1863.	West Virginia.	<b>Conf.</b>	Conf.	*	22	78	34	66

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPOSANT	VICTOR	CASUALTIES			
						UNITED STATES		OPPOSANTS	
						Killed	Wounded	Killed	Wounded
<b>Siege of Charleston</b> (ended).	May 12, 1780.	South Carolina.	<b>Str Henry Clinton</b> vs. Gen. Lincoln.	English.	Eng.	92	142	76	189
<b>Siege of Suffolk, N. C.</b> (ended).	May 3, 1863.	North Carolina.	Conf. U. S.	Conf.	U. S.	15	94	898	1,202
<b>Si-Mile House.</b>	Aug. 18-21, 1864.	Kentucky.	Conf. U. S.	Conf.	U. S.	212	1,155	862	3,138
<b>Somerset.</b>	March 30, 1863.	Kentucky.	Conf. U. S.	Conf.	U. S.	11	39	24	73
<b>Southfield—Albmarle.</b>	April 19, 1864.	Plymouth, N.C.	<b>Capt. J. W. Cooke</b> vs. Lt. C. W. Flusser.	Conf. U. S.	Conf.	2	12	0	0
<b>South Mills or Camden.</b>	April 20, 1862.	North Carolina.	Conf. U. S.	Conf.	U. S.	15	98	12	67
<b>South Mountain.</b>	Sept. 14, 1862.	Maryland.	<b>Franklin, Reno and Hooker</b> vs. Hill and Cobb.	Conf. U. S.	Conf.	312	1,234	224	860
<b>Spanish Fort</b> (to April 8).	March 26, 1865.	Alabama.	Conf. U. S.	Conf.	U. S.	99	698	153	401
<b>Spanish squadron destroyed off Santiago.</b>	July 3, 1898.	Cuba.	<b>Adm. Sampson</b> and <b>Adm. Schley</b> vs. <b>Adm. Cervera</b> .	Spanish.	Spanish.	1	1	342	461
<b>Spottsylvania.</b>	May 8-11, 1864.	Virginia.	Conf. U. S.	Conf.	U. S.	2,288	19,278	3,342	20,187
<b>Spottsylvania.</b>	May 18, 1864.	Virginia.	<b>Gen. Grant</b> vs. <b>Gen. Lee</b> .	Conf. U. S.	Conf.	2,031	7,956	1,752	7,248
<b>Springfield.</b>	Jan. 8, 1863.	Missouri.	<b>Gen. Brown</b> vs. <b>Gen. Marmaduke</b> .	Conf. U. S.	Conf.	14	145	23	164
<b>Spring Hill.</b>	March 3, 1863.	Tennessee.	<b>Gen. Hood</b> vs. <b>Gen. Schofield</b> .	Conf. U. S.	Conf.	8	14	1	4
<b>St. Charles.</b>	Jan. 17, 1863.	Arkansas.	Conf. U. S.	Conf.	U. S.	136	20	6	8
<b>St. James—ship (armed).</b>	Dec. 30, 1781.	New York.	<b>Capt. Truxton</b> (U. S.) vs. <b>Gen. Gales</b> vs. <b>Gen. Burgoyne</b> .	English.	U. S.	1	4	2	8
<b>Stillwater.</b>	Sept. 19, 1777.	New York.	<b>Col. Matland</b> vs. <b>Gen. Lincoln</b> .	English.	Eng.	98	252	161	328
<b>Stone Ferry.</b>	June 2, 1778.	South Carolina.	<b>Gen. Chander</b> vs. <b>Col. Vincent</b> .	English.	Eng.	51	99	31	63
<b>Stonington.</b>	Aug. 11, 1814.	Connecticut.	English.	U. S.	U. S.	1	5	21	55
<b>Stony Creek.</b>	June 6, 1813.	Canada.	English.	U. S.	U. S.	17	38	201	30
<b>Stony Lake.</b>	Jan. 23, 1813.	Tennessee.	Ind. U. S.	Ind.	Ind.	400	0	0	0
<b>Strawberry Plains, etc.</b>	July 29, 1863.	Dakota.	Ind. U. S.	Ind.	Ind.	12	42	32	98
<b>Stony Point.</b>	Aug. 18, 1864.	Tennessee.	Conf. U. S.	Conf.	U. S.	401	1,754	888	762
<b>Sturgis's Raid</b> (to May 3).	July 16, 1779.	New York.	<b>Gen. Anthony Wayne</b> vs. <b>Col. Johnson</b> .	English.	U. S.	20	70	63	31
<b>Swift Creek.</b>	April 28, 1863.	Alabama, Georgia.	Conf. U. S.	Conf.	U. S.	12	69	0	0
<b>Talaboga.</b>	Jan. 28, 1815.	Brest.	<b>Capt. Barnes</b> (U. S.) vs. <b>Capt. Perry</b> (U. S.).	Conf. U. S.	Conf.	6	17	0	1
<b>Tallichachies.</b>	May 9-10, 1864.	Virginia.	Conf. U. S.	Conf.	U. S.	90	401	124	376
<b>Tamulay.</b>	Oct. 26, 1846.	Mexico.	<b>Capt. Perry</b> (U. S.) vs. <b>Gen. Jackson</b> (U. S.).	Mexican.	U. S.	0	0	4	10
<b>Tibb's Bend.</b>	Nov. 9, 1813.	Creek Nation.	<b>Gen. Coffee</b> (U. S.) vs. <b>Capt. Higelow</b> (U. S.).	Indians.	U. S.	15	86	299	0
<b>Ticonderoga.</b>	Nov. 3, 1813.	Creek Nation.	Indians.	U. S.	U. S.	5	41	186	0
<b>Tippicanoe.</b>	June 30, 1847.	Mexico.	<b>Capt. Higelow</b> (U. S.) vs. <b>Col. Ethan Allen</b> and <b>Col. Benedict Arnold</b> (U. S.).	Mexican.	U. S.	6	33	42	103
<b>Tom—Forward.</b>	March 4-5, 1863.	Tennessee.	Conf. U. S.	Conf.	U. S.	99	24	152	453
<b>Town Creek.</b>	July 4, 1863.	New York.	Conf. U. S.	Conf.	U. S.	6	23	280	687
<b>Trenton.</b>	May 10, 1778.	New York.	English.	U. S.	U. S.	.....	.....	.....	.....
<b>Trevilian Station.</b>	Nov. 7, 1811.	Indiana.	<b>Gen. Harrison</b> vs. <b>The Prophet</b> .	Indians.	U. S.	37	151	120	180
<b>Trumbull—Irish.</b>	Nov. 12, 1813.	Baltimore.	<b>Capt. T. Wilson</b> (U. S.) vs. <b>Gen. Washington</b> .	English.	U. S.	0	2	8	13
<b>Trumbull—Wall.</b>	Feb. 20, 1865.	North Carolina.	Conf. U. S.	Conf.	U. S.	51	81	81	181
<b>Trumbull—Grapesports.</b>	Dec. 25, 1776.	New Jersey.	English.	U. S.	U. S.	2	4	17	78
<b>Tunnel Hill.</b>	June 11-12, 1864.	Virginia.	<b>Gen. Sheridan</b> vs. <b>Wade Hampton</b> and <b>Fitzhugh Lee</b> .	Conf. U. S.	Conf.	85	490	124	882
<b>Tupelo, Harrisonburg and Old Town Creek.</b>	Aug. 7, 1781.	Capes of Del.	<b>Capt. James Nicholson</b> (U. S.) vs. <b>Capt. James Nicholson</b> (U. S.).	English.	Eng.	5	11	0	3
<b>Tuspan.</b>	June 2, 1780.	35° 54' N. 66° W.	<b>Capt. James Nicholson</b> (U. S.) vs. <b>Capt. Dudley Saltonstall</b> (U. S.).	English.	U. S.	19	20	39	52
<b>Tyrannicide—Dispatch.</b>	April 9, 1777.	New York.	Conf. U. S.	Conf.	U. S.	7	8	9	14
<b>Tyrannicide—Rescue.</b>	Feb. 22, 1864.	Georgia.	Conf. U. S.	Conf.	U. S.	150†	200†	60†	180
<b>U'bor—boats.</b>	July 15, 1864.	Mississippi.	Conf. U. S.	Conf.	U. S.	85	563	184	516
<b>Underwriter.</b>	April 18, 1847.	Mexico.	<b>Capt. Perry</b> (U. S.) vs. <b>Capt. J. Fluke</b> vs. <b>Capt. J. Fluke</b> vs. <b>Capt. Kendall</b> vs. <b>Capt. Mathews</b> (U. S.).	Mexican.	U. S.	3	11	25	34
<b>Union—Irish.</b>	March 12, 1776.	Nova Scotia.	Conf. U. S.	Conf.	U. S.	1	2	2	5
<b>United States—Macedonian.</b>	March 29, 1779.	Bermuda.	Conf. U. S.	Conf.	U. S.	0	8	11	22
<b>Upperville.</b>	Jan. 5, 1813.	Virginia.	Conf. U. S.	Conf.	U. S.	0	2	1	7
<b>Ursins.</b>	Jan. 30, 1864.	New Bern, N. C.	<b>Com. John T. Wood</b> vs. <b>Acting-Master Jacob Westervelt</b> .	Conf. U. S.	Conf.	9	20	6	32
<b>Van Buren.</b>	Jan. 26, 1813.	English.	Eng.	Eng.	Eng.	1	3	0	2
<b>Vaught's Hill.</b>	Oct. 25, 1812.	English.	U. S.	U. S.	U. S.	8	7	26	68
<b>Vengeance—Defiance.</b>	June 21, 1863.	Lower California.	<b>Lt. Stidon</b> vs. <b>Col. Teller</b> .	Mexican.	U. S.	30	70	60	100
<b>Vengeance—Harriet.</b>	Nov. 19, 1847.	Arkansas.	Conf. U. S.	Conf.	U. S.	0	0	6	12
<b>Vera Cruz.</b>	Feb. 10, 1863.	Tennessee.	<b>Capt. Stidon</b> vs. <b>Col. Carroll</b> .	Conf. U. S.	Conf.	0	3	2	5
<b>Vicksburg.</b>	March 30, 1863.	North Atlantic.	<b>Capt. Deane</b> (U. S.) vs. <b>Capt. Newman</b> (U. S.).	Conf. U. S.	Conf.	23	33	63	241
	Oct. 15, 1779.	North Atlantic.	Conf. U. S.	Conf.	U. S.	3	5	4	11
	Sept. 18, 1778.	Vera Cruz.	<b>Gen. Scott</b> and <b>Com. Perry</b> vs. <b>Gen. Landero</b> .	Mexican.	U. S.	11	56	981	2,000†
	March 24, 1847.	Mississippi.	<b>Adm. Porter</b> .	Conf. U. S.	Conf.	0	3	7	18

## AMERICAN BATTLES, TABULATED—Continued

NAME OF BATTLE	DATE	APPROXIMATE LOCATION	COMMANDERS	OPPONENT	VICTOR	CASUALTIES			
						UNITED STATES		OPPOSERS	
						Killed	Wounded	Killed	Wounded
<b>Vicksburg.</b>	May 19-25, 1863.	Mississippi.	Gen. Pemberton vs. Gen. Grant.	Conf.	*	1,548	2,378	1,420	2,181
<b>Vicksburg Assault.</b>	Dec. 27-28, 1862.	Mississippi.	Gen. Pemberton vs. Gen. Sherman.	Conf.	Conf.	724	990	63	134
<b>Vicksburg (ended).</b>	July 4, 1863.	Mississippi.	Gen. Grant vs. Gen. Pemberton.	Conf.	U. S.	545	3,688	25	20
<b>Wasp—Aven.</b>	Sept. 1, 1814.	47° 30' N. 11° W.	Com. Johnston Blakeley vs. Capt. John J. Arbutnot.	English.	U. S.	2	1	10	32
<b>Wasp—packet.</b>	Oct. 6, 1782.		Capt. McNeill (U. S.)	English.	U. S.	3	10	4	17
<b>Wasp—Felic.</b>	Oct. 18, 1812.		Com. Jacob Jones vs. Capt. Thomas Whingates.	English.	U. S.	5	5	15	47
<b>Wasp—Reindeer.</b>	June 28, 1814.		Com. Johnston Blakeley vs. Capt. R. W. Manners.	English.	U. S.	11	15	25	42
<b>Wauhatchie.</b>	Oct. 27-29, 1863.	Tennessee.	Gen. Hooker vs. Gen. Longstreet.	Conf.	U. S.	76	339	153	208
<b>Wauhatchie.</b>	May 15, 1780.	South Carolina.	Col. Tarleton vs. Col. Buford.	English.	U. S.	250	130	5	14
<b>Wauhatchie—Atlanta.</b>	June 17, 1863.	Waraw Sound Georgia.	Capt. John Rodgers vs. Lt. Wm. A. Webb.	Conf.	U. S.	0	0	8	8
<b>Weldon Railroad.</b>	June 23, 1864.	Virginia.	Gen. Hill vs. Burney and Wright.	Conf.	U. S.	604	2,494	156	344
<b>West Point.</b>	May 7, 1862.	Virginia.	Gen. Franklin vs. Gen. G. W. Smith.	Conf.	U. S.	84	110	3	18†
<b>White Oak Swamp.</b>	June 29, 1862.	Virginia.	Gen. Franklin vs. Gen. Jackson.	Conf.	U. S.	24	42	65	95
<b>White Plains.</b>	Oct. 25, 1776.	New York.	Gen. Washington vs. Gen. Howe, Gen. Clinton, Gen. Knyphausen and Gen. De Ruster Shady.	English.	*	24	66	89	144
<b>White River.</b>	June 27, 1864.	Arkansas.	Gen. Sully vs. Sioux Indians.	Conf.	U. S.	52	148	162	341
<b>Whitestone Hill.</b>	Sept. 3, 1863.	Dakota.	Gen. Sully vs. Sioux Indians.	Conf.	U. S.	8	23	194	42
<b>White Sulphur Springs.</b>	Aug. 26, 1863.	Virginia.	Gen. Longstreet vs. Gen. McDowell.	Conf.	Conf.	63	144	42	75
<b>Wilcox's Bridge.</b>	March 8-10, 1865.	North Carolina.	Conf.	Conf.	Conf.	80	421	132	543
<b>Wilderness.</b>	May 5-7, 1864.	Virginia.	Gen. Grant vs. Gen. Lee.	Conf.	U. S.	2,309	12,188	1,956	10,444
<b>Wile Reward—ship.</b>	Nov. 14, 1813.	Nova Scotia.		English.	U. S.	6	40	82	0
<b>Williamsburg.</b>	May 5, 1862.	Virginia.	Hooker, Kearney and Hancock vs. Longstreet.	Conf.	U. S.	456	1,400	351	1,403
<b>Williston Station.</b>	Feb. 8, 1865.	South Carolina.	Conf.	Conf.	U. S.	2	3	3	6
<b>Wilson Creek.</b>	Aug. 10, 1861.	Missouri.	Gen. Price vs. Gen. Lyon.	Conf.	U. S.	223	721	331	764
<b>Wilson's Raid (June 22-30).</b>	June 30, 1864.	Virginia.	Gen. Wilson vs. W. H. F. Lee, Wade Hampton, Fitzhugh Lee, Mahone.	Conf.	U. S.	76	265	48	252
<b>Wilson's Raid (to April 24).</b>	March 22, 1865.	Alabama-Georgia.	Gen. Wilson vs. Gen. Forrest.	Conf.	U. S.	99	596	352	1,231
<b>Winchester.</b>	May 25, 1862.	Tennessee.	Col. Lytle (U. S.)	Conf.	Conf.	38	154	68	329
<b>Winchester.</b>	June 14-15, 1863.	Virginia.	Gen. Ewell vs. Gen. Milroy.	Conf.	Conf.	203	397	80	61
<b>Winton.</b>	Feb. 19, 1862.	North Carolina.	Capt. Rowan and Col. Hawkins vs. Col. Williams.	Conf.	*	0	0	1	4
<b>Wood Lake.</b>	Sept. 22, 1862.	Minnesota.	Gen. H. H. Sibley vs. Little Crow.	Indians.	U. S.	8	24	84	138
<b>Wyoming, or Fort Forty.</b>	July 3, 1778.	Pennsylvania.	Conf.	English.	Eng.	225	0	2	8
<b>Wyoming—Japanese batteries.</b>	July 16, 1863.		Capt. John Butler and Brandt (Eng.)	Japanese.	U. S.	6	4	100	200
<b>Wytheville.</b>	July 18, 1863.	Virginia.	Conf.	Conf.	Conf.	21	62	3	8
<b>Yankee—Royal Bounty.</b>	Aug. 1, 1812.	Hallifax.	Capt. Oliver Wilson vs. Capt. Henry Gambles.	English.	U. S.	0	2	2	7
<b>Yellow Bayou.</b>	May 19, 1864.	Louisiana.	Conf.	Conf.	U. S.	42	108	74	158
<b>York.</b>	April 27, 1813.	Canada.	Gen. Pike vs. Gen. Sheaffe.	English.	U. S.	66	203	100†	302
<b>York—Lord Somers.</b>	April 18, 1814.	Nova Scotia.	Capt. E. Staples (U. S.)	English.	*	0	0	6	12
<b>Yorktown (ended).</b>	Oct. 19, 1781.	Virginia.	Gen. Washington and Count de Rochambeau vs. Lord Cornwallis.	English.	U. S.	8	16	199	353

**Belgium.**—In the time of the Romans the name *Gallia Belgica* was given to the Southern Netherlands lying on the confines of Gaul and Germany, peopled by Celtic and German tribes. Until the close of the eleventh century the feudal system, which arose at the fall of the Carolingian dynasty, prevailed in the Netherlands, where the several southern provinces were made duchies and counties. After the abdication of Charles V. these provinces passed into the hands of Philip II., and by the law of primogeniture should have

remained united with Spain. But scarcely had the peace of Chateau-Cambresis put an end to the encroachments of France, when the religious disputes of the Reformation, and the despotic measures of Philip, excited in the provinces a long and bloody war for civil and religious freedom, which ended in the independence of the Northern or Protestant Netherlands, while the Southern endured a long conflict with the Spanish, and, afterward, French authorities.

The kingdom of Belgium originated in 1830,

by the secession from the kingdom of the Netherlands of its southern provinces, the former Austrian Netherlands and the bishopric of Liège. A provisional government was formed, and was acknowledged by the whole of Belgium. The resolution of the Dutch Parliament that Belgium and the Netherlands should be separately administered, but under the same king, came too late to check the revolution. The crown of the new kingdom was offered to Leopold of Saxe-Coburg, husband of the Princess Charlotte of Eng-

and uncle of Queen Victoria, and accepted by him in 1831. In the ensuing struggle the Dutch forces defeated the Belgians; but the latter were speedily supported by a French army, and the Dutch and French fleets, by British and French fleets. King William had, therefore, to recognise the inevitable, and Belgium became definitely (1832) a separate kingdom. In 1849 a new commercial treaty for ten years was concluded with France, and the duration of the treaty with the German Zollverein was lengthened.

Leopold II. succeeded to the throne in 1865. In recent years the chief feature of Belgian politics has been a keen struggle between the clerical and the liberal party. Till 1878 the clerical party maintained the upper hand, but to a large extent the clerical party at the elections. In 1877 a bill was passed to put down corruption, and to increase the number of towns deputies to the chamber of representatives; and at the next elections in June, 1878, the liberals gained a majority, which they lost in 1884. The clerical party continued in power till 1894, when it again obtained a large majority, and a bill giving an extension of the franchise was passed. Recent years have been marked by socialist movements and labor troubles. Leopold II. died in 1909, and was succeeded by Albert.

**References.**—*Bouquier's History of Belgium; Sanderson's Belgium and the Belgians; Smythe's History of Belgium; Vincent's Constitution of Belgium.*

**Bolivia.**—Bolivar, the liberator of Bolivia, drew up a constitution, which was adopted in the year 1827. This constitution, which was exceedingly complicated, vested the executive power in a president for life, with the privilege of naming his successors; and the legislative function in three bodies, a senate, tribunes, and censors. The code and constitution of Bolivar were soon after abandoned and the latest constitution bears the date 1860. But the constitution has rarely been observed, and to assert itself peacefully, the history of Bolivia, from the presidency of Gen. Santa Cruz (1828-39), being a record of military insurrections, the victor for the time being making himself supreme.

In 1836 a federal republic was formed, consisting of three states, North Peru, South Peru, and Bolivia, with Santa Cruz as common protector, but the protector was overthrown in 1839, and the confederation dissolved. In 1841 Peru made war upon Bolivia, but the Peruvian president was defeated and killed at the battle of Yaguai, and peace was soon after restored. During the succeeding period, up to the war with Chili, only two presidents were regularly elected, Dr. Linarez, in 1858, and Col. Ballivian, in 1875.

In 1879 began the disastrous war with Chili, its cause being the disputed possession of the rich nitrate region of Atacama, on the Pacific coast, Bolivian territory, but which had been seized, and its deposits worked, by Chili. In the war that followed Bolivia and its ally, Peru, were decisively beaten, and as a result of the war the nitrate region was annexed to Chili, and Bolivia deprived of the province of Pedro Alvarado.

A boundary dispute with Brazil as to the territory of Acre was settled in 1903, when, in return for Upper Acre, Upper Jurua, and Upper Jurua, Bolivia accepted territory on the frontier of Matto Grosso and the river Madeira (1,221 square miles), together with a money payment of \$10,000,000, and commercial facilities. An important railway connecting Brazil and Bolivia was opened in 1909.

**References.**—*Suarez's Notes on Bolivia; Conway's Bolivian Andes; Mathews' Through Bolivia.*

**Brazil** was discovered in 1499 by Vicente Yanez Pinzon, one of the companions of Columbus in the service of Spain, and next year was taken possession of by Pedro Alvarez Cabral on behalf of Portugal. The first governor-general was Thome de Sousa, who in 1549 arrived in the Bay of Bahia and established the new city of Brazil, making it the seat of his government.

The usurpation of the crown of Portugal by Philip II. left Brazil in a defenseless and neglected condition, and the English, French, and Dutch made successive attempts to obtain a footing. The Dutch were the most

persevering, and for a time almost divided the Brazilian territory with the Portuguese. The tyranny of the Dutch governors, however, incited their native and Portuguese subjects to revolt, and after a short war, in 1654 the Dutch were driven out and the Portuguese remained masters of an undivided Brazil. The value of Brazil to Portugal continued steadily to increase after the discovery of the gold mines in 1698 and the discovery of the diamond mines in 1728.

The vigorous policy of the Portuguese monarchs, and the influence of the Marquis de Pombal (1760-77) did much to open up the interior of Brazil, though his high-handed modes of procedure left among the Brazilians a discontent with the home government which took shape in the abortive revolt of 1789.

On the invasion of Portugal in 1808 by the French the sovereign of that kingdom, John VI. fled to Brazil, accompanied by his court and a large body of emigrants. He raised Brazil to the rank of a kingdom, and assumed the title of king of Portugal and Brazil, and on his return to Portugal he found the Portuguese cortes unwilling to grant civil and political equality to the Brazilians—a fact which raised such violent conclusions in Rio de Janeiro and other parts of Brazil, that Dom Pedro, the king's son, was forced to head the party resolved to make Brazil independent, and in 1822 a national assembly declared the separation of Brazil from Portugal, and appointed Dom Pedro the constitutional emperor.

In 1864 began a severe struggle between Brazil and Paraguay, caused principally by the arbitrary conduct of Lopez, the dictator of Paraguay. Brazil, though joined by Uruguay and the Argentine Confederation, had to bear the brunt of the war, which terminated only with the death of Lopez in 1870. This struggle was attended with an immense expenditure of men and money to Brazil, but it established her reputation as a great power, and secured the freedom of the navigation of the Rio de la Plata river system.

In 1871 an act was passed for the gradual emancipation of slaves, and in 1888 slavery was finally abolished. In 1889 took place the revolution and establishment of the republic. The provisions of the president Fonseca led to a revolutionary movement in 1891, which was not quelled without difficulty, and Rio de Janeiro was several times bombarded. In 1906-7 Brazil took the lead in an effort to reach a better understanding among the countries of North and South America. A great demonstration was given by the city of Rio de Janeiro, in 1908, to the United States Pacific squadron. Hermes da Fonseca became president in 1910.

**References.**—*The United States of Brazil, by Bureau of American Republics; Martin's Through Brazil; Alcott's Brazil; Nery's The Land of the Amazona.*

**Bulgaria.**—The Bulgarians belonged originally to the Uraltic stock, but have adopted a Slavic dialect. First crossed the Danube in the sixth century A. D., by 1186 they had split into three principalities, and from 1393 fell under the domination of the Turks. In 1906-7 Bulgaria took the lead in an effort to reach a better understanding among the countries of North and South America. A great demonstration was given by the city of Rio de Janeiro, in 1908, to the United States Pacific squadron. Hermes da Fonseca became president in 1910.

In 1885 a national rising took place in eastern Roumelia, the Turkish governor was expelled, and union with Bulgaria proclaimed. In consequence, Servia demanded an addition to her own territory, and in 1885, began a war against Bulgaria, in which she was severely defeated. By the treaty which followed, the Prince of Bulgaria was appointed governor-general of eastern Roumelia for a term of five years, to be re-nominated at the end of the term.

These events greatly irritated Russia, whose agents managed to seduce certain regiments of Bulgarians; and in August, 1886, the prince was seized and carried off, whereupon a proclamation was issued to the effect that he had been executed. When he was set free on Austrian

territory he discovered that the people were still with him, and determined to return. Seeing, however, that his presence would cause an immediate interference on the part of Russia, he formally abdicated and left the country (1886). In 1887 Prince Ferdinand of Saxe-Coburg accepted an invitation to occupy the throne; but his position was insecure till the six great powers sanctioned the step taken by him.

**References.**—*Dixon's The Present State; Samuelsen's Bulgaria; and Fraser and Miller's The Balkans; Herbert's Bulgaria and the Balkans.* **Canada** is said to have been discovered by Sebastian Cabot in 1497. In 1535 it was taken possession of by Jacques Cartier, in the name of Francis I., and called New France. In 1542, La Roque of Roberval, at no great distance from Quebec, founded the fort of Charlesbourg; and in 1608, Samuel Champlain said the foundation of Quebec. In 1617 a French expedition was formed to explore the colony; after which the English made several attempts between 1689 and 1711, without much success.

In 1754 the war between France and England broke out, and continued till between 1760-60, when Canada was conquered by the British, and definitely ceded to them by the treaty of Paris. The chief events of this war was the taking of Quebec, in 1759, where the French general, Montcalm, and the British leader, Wolfe, both fell, mortally. In 1776, during the American war of independence, Canada, in 1775, was invaded, but without success. In 1791 an act of Parliament divided Canada into two provinces—an upper and a lower Canada.

In 1812, during the second American war, Upper and Lower Canada were the scenes of frequent combats between the British and Americans. In 1837 and 1838 both provinces were shaken by a violent insurrectionary movement, which was finally quelled. The two provinces were again united in 1841. In 1858 Ottawa was finally selected as the capital of Canada, the observance being referred to the queen of England.

During these years the population of Upper Canada, or Ontario, had been rapidly increasing, and now exceeds that of Lower Canada or Quebec by nearly 300,000. Under the old constitution, however, the two provinces had equal representation in the legislature. Hence a demand arose on the part of the Upper Canadianists for a more equitable representation. This demand was practically conceded in a scheme of federation of the British North American colonies approved of by the Canadian Parliament at Quebec in 1865 and forwarded to the imperial government for approval. In 1866 the reciprocity treaty with the United States having expired, the government of that country practically refused to renew it except on the most disadvantageous terms for Canada. About the same time a Fenian movement against Canada, originating in the United States, began to be heard of. Gangs of desperadoes, mostly from Canada, crossed the frontier, collected near the frontier, and ultimately crossed, occupying some villages and plundering the neighborhood. But the promptustering of Canadian volunteers made the filibusters recross the frontier in some haste, to be ultimately disarmed and dispersed by United States troops.

In 1867 the British North America act for confederation of the colonies was passed by the British Parliament. It united Upper Canada, or Ontario, Lower Canada, or Quebec, New Brunswick, and Nova Scotia, into one territory, to be named the Dominion of Canada. Newfoundland was declared an associate province in confederation, but with that exception all the British territory north of the United States was gradually included within the Dominion. Hudson's Bay company's territory by purchase in 1868, British Columbia in 1871, Prince Edward Island in 1873.

In 1870 an insurrection of the Red river settlers led to a declaration of war as to how the titles to their lands might be affected by thecession of the Hudson's Bay company's rights, took place under the leadership of Louis Riel, and had to be suppressed by a military expedition under Colonel (now Viscount) Wolseley. To reassure the settlers

a part of the newly-purchased territory was erected into an independent province under the name of Manitoba, the organized territory beyond receiving the name of the Northwest Territory.

In 1871 the Washington treaty arranged that the fisheries of both Canada and the United States should be shared equally for the next twelve years, Canada receiving a compensation, afterward fixed at five and a half million dollars, for its fisheries.

In 1884 considerable disturbance was caused among the half-breeds and Indians in the Saskatchewan and Assiniboine districts on account of the difficulty of obtaining valid titles to their lands. The discontent at length took shape in an insurrection which Louis Riel was invited to head. The rebels seized the government stores at Duck Lake and induced some of the Indian tribes to cooperate with them; with the result that a massacre of settlers took place at Frog's lake. Within a few months an expedition under Gen. Middleton, who had under his command several thousand volunteers, suppressed the rebellion. One hundred were arrested. Riel was tried and executed at Regina on July 28, 1885.

On November 7th of the same year the Canadian Pacific railway (which see) was completed, being opened for through traffic the following year. Since 1883, when the Washington treaty expired, disputes between the American and Canadian fishermen have again been frequent, and several American fishing vessels have been seized on the Canadian coast, and others prevented from buying bait. A joint British and American commission was instituted in 1887, for the adjustment of differences, but no final settlement has yet been arrived at. The seal fishing in Behring's Sea also caused friction with the United States, but this matter, as well as the boundary between Canada and Alaska, was adjusted in 1903. The year 1905 marked the formation of several new provinces. In September, 1905, a serious riot, directed against the Japanese and Chinese, broke out in Vancouver, largely organized by American labor agitators, but supported by local malcontents. The Dominion authorities suppressed the outbreak.

**References.**—Bourinot's *Canada*; Bradley's *Canada in the Twentieth Century*; Conkurn's *Political Canada*; Kincaid's *Canada*; Macmillan's *Canada*; Morgan and Burpee's *Canada: Its Town and Country*; Parkman's *Works*; Whitten's *Canada: the New Nation*.

**Chili.**—Prior to the Spanish conquest, Chili belonged to the Peruvian Incas. In 1535 Pizarro sent Almagro to invade the country, and in 1540, Valdivia, the latter of whom subjugated most of the country excepting Araucania. The revolution which separated the colony from Spain broke out in 1810, and in 1817 the victory of Maipu, gained by General San Martin, permanently secured the independence of Chili. In 1865 Chili joined Peru in a war against Spain, in which Valparaiso was bombarded and suffered great loss. Peace was obtained through the mediation of the United States in 1869.

In 1879 a war broke out with Bolivia and Peru, in reference to the rights of Chili in the mineral districts of Atacama. This war was virtually finished in 1881, and the victorious Chileans gained a large accession of territory from both Bolivia and Peru. From the year of 1879-80 it was in Peru that the peace and prosperity till 1891, when owing to President Balmaceda's aiming at dictatorial powers, a rebellion broke out which ended in Balmaceda's defeat. Boundary disputes with Argentina were referred to British arbitration and arranged in 1898. In 1907 a number of labor disturbances in the mining regions called for armed intervention.

**References.**—Childe's *The South-American Republics*; Hancock's *A History of Chili*; Harvey's *Dark Days in Chili*; Russell's *A Visit to Chili and the Winding Fields of Tarapaca*; St. John's *Chili: a Progressive State*; Wiesner's *Chili and the Nations*.

**China.**—Chinese historical documents begin with the reigns of Yao and Shun (2336-2206 B. C.). In 403 B. C. we find only seven great states, all sooner or later claiming to be 'the kingdom,' and contending for the supremacy; till Tsin (China) put down all the others, and

in 221 B. C. its king assumed the title of Hwang Ti, or emperor. From that year dates the imperial form of the government.

The changes of dynasty have been many, two or more sometimes ruling together, each having but a nominal supremacy over the whole nation. The greater dynasties have been those of Han (206 B.C.-220 A.D.), Tang (618-906), Sung (960-1279), Yuan (the Mongol, 1280-1367), the Ming (1368-1643), and the Ching (Manchou-Tartar), from the Manchou conquest of China in 1643 to the present date.

It was not till after the Cape of Good Hope was doubled, and the passage to India discovered by Vasco da Gama in 1497, that intercourse between any of the European nations and China was possible by sea. It was in 1516 that the Portuguese first made their appearance at Canton; and they were followed at intervals first by the Spaniards, the Dutch, and the English in 1655. The Chinese received none of them cordially; and Chinese dislike of them was increased by mutual jealousies and collisions.

As maritime trade with the west increased, and there grew up the importation of opium from India. Before 1767 the import rarely exceeded 200 chests, but in that year it amounted to 1,000. In 1792 the British government sent an embassy under Lord Macartney to Peking. A second embassy from Great Britain in 1816 was dismissed from Peking suddenly and contemptuously because the ambassadors would not perform the prostrations required. From the measures of the Chinese to prevent the import of opium resulted the war between China and Great Britain, in 1840; the result of which was the opening of Canton, Amoy, Foo-Chow, Ningpo, and Shanghai to commerce, and the cession of Hong Kong to Great Britain. A second war in 1857, France being allied with Great Britain, ended in the opening of five more treaty ports. A third war (1860) and the march on Peking did even more to open China to the world. After a war in 1884-5 between the United States and Japan, the treaty secured permanent control of Tonkin and Annam.

In 1894 Japan, reviving old claims, drove the Chinese out of Korea, and after victories on land and at sea, captured Port Arthur and Wiaiwai. By the treaty of 1894 Japan secured an indemnity, Formosa and the Liaotung peninsula; but the protests of Russia, Germany, and France made Japan withdraw. Russia then secured a lease of Port Arthur and Talienwan, with railway and other privileges in Manchuria; Germany obtained Kiauchau and concessions in Shantung; and Britain, as an offset, obtained a lease of Weihaiwei and sought to secure trading freedom in the Yangtszeakiang valley. Russia's refusal to evacuate Manchuria and her movements in Korea led to war with Japan in 1903, the defeat of the Russian armies in Manchuria, the destruction of the Russian fleet, and the fall of Port Arthur (1905), China being nominally neutral. By the peace of 1905 Japan secured dominance in Korea, the Russian lease of Port Arthur, and great influence in southern Manchuria and in China generally.

A series of far-reaching reforms, promoted by a national reform party in 1905, were summarily canceled by the dowager empress, who assumed supreme authority; and the reactionary and anti-foreign 'Boxer' association was suppressed in 1901. The 'Twenty-four Harmonies,' encouraged by the court, made extermination of the foreigners its war-cry and besieged the foreign legations in Peking, relieved after a two months' siege by an international force of Japanese, Russian, British, Americans, French and Germans. They remained in occupation for over a twelvemonth. Finally, the peace protocol was signed Sept. 7, 1901, and the dowager returned to her capital. The foreign troops were withdrawn; and Russia in terms of a convention, drafted 1901, unconditionally evacuated, which her troops had occupied, should be gradually evacuated; but the undertaking was not fulfilled.

This breach of faith was a considerable factor in the outbreak of the Russo-Japanese war (1904). Prior to the outbreak of war

China undertook to remain strictly neutral. An Anglo-Chinese labor convention, containing the regulations for the importation of Chinese laborers into the Transvaal, and their control, was signed in 1904, and a treaty similar to those already concluded with Great Britain, the United States, and Japan was made with Portugal in 1904. In 1905, Mr. Hart published his scheme for the reorganization of the financial and military resources of the country. In 1907-8 a number of edicts were issued regarding the extension of self-government in the cities, and a larger degree of civil liberty, and, in August, 1908, a limited constitution was proclaimed.

**References.**—Martin's *Land of Cathay*; Parsons' *An American Explorer in China*; R. Ross, in *Conclusion*; Michel's *Englishman in China*; House's *Mansu*; Rockhill's *Land of the Lohan*; Williams' *The Middle Kingdom*; Bower's *China*; Legg's *Chinese Classics*; Mayer's *The Chinese Government*; Scott's *The People of China*; Parker's *China and Religion*.

**Colombia**, formerly New Granada, was discovered by Alonso de Ojeda in 1499; it was visited by Columbus on his fourth voyage, in 1502. The first Spanish settlement was made in 1510 at Santa Maria in the Gulf of Darien, and the whole country was formed into a province under a captain-general in 1547. New Granada was declared the independence of Spain in 1811, and, after eleven years of warfare, succeeded, with the help of Venezuela, in effecting its liberation. Both states were united with Ecuador to form the Spanish domination, to form the first republic of Colombia; but internal dissensions arising, the three states again separated in 1830, and three independent republics, which have had a very troubled existence.

In 1861 the states forming New Granada by agreement adopted a new constitution, the republic being then called the United States of Colombia. This title was retained till, by the new constitution adopted in 1886, the state ceased to be a federal republic and became a unitary republic, the name of Republic of Colombia. The secession of Panama in 1903 was partly brought about by the dilatoriness of the central government in carrying out a treaty arrangement with the United States in regard to the construction of the Panama canal.

**References.**—Scruggs' *The Colombian Republic*; The *United States of Colombia*; Moore's *Constitution of Colombia*.

**Costa Rica** was discovered by Columbus in 1502. Diego de Nicuesa failed in an attempt to colonize it in 1509. The first settlement was made by Francisco Hernandez in 1523, and the country was conquered 1526-65. Independence was declared in 1821, and the territory formed part of the federal republic of Central America from 1823 to 1839. A constitution was promulgated in 1870, and frequently modified since. Between 1870 and 1882 it was under a series of dictators. The president in 1910 was Ricardo Jimenez.

**References.**—Villafraza's *Costa Rica*; Church's *Costa Rica*; Castro's *The Republic of Costa Rica*. **Cuba** was discovered by Christopher Columbus, was discovered in 1492 by Columbus, and first settled by Spaniards at Baracoa in 1511. Havana, founded in 1519, was reduced to a city in 1562, and San Juan de los Rios in 1554. In 1762 the English took and held Havana for a year. In 1818 the trade of Cuba was opened to the world, and for some years the island enjoyed unexampled prosperity. In 1895, when the Spanish empire in Cuba developed its sugar industry. An insurrection against the Spanish authorities went on from 1895 to 1898, a new one broke out in 1898, and the Spanish empire in suppressing it led to the intervention of the United States and the war, disastrous to Spain, of 1898-9. After the war Cuba was occupied by the United States till 1902, when a separate constitution was given to it as an independent republic, closely connected with the United States by a reciprocal commercial convention.

**References.**—Davies's *Cuba, Past and Present*; Clark's *Commercial Cuba*; Fiske's *Discovery of America*; Hill's *Cuba and Porto Rico*; Pepper's *The Men of Cuba*; and the *Spanish-American War*; Denmark's *The Spanish-American War*.

**Denmark.**—The early history of Denmark is lost in the twilight of the saga period, with

its vikings and their valiant deeds. The Danes coming from the islands occupied the lands deserted by the Jutes and Angles who had in the century migrated to England. The Danish monarchy was founded in 936 by Gorm the Old, whose son became a Christian. Waldemar I. (1157-82) ruled Norway also, and conquered Schleswig and Pomerania; under his son Waldemar II, further conquests were made in German and Wendish lands, so that the Baltic became a Danish sea.

By the treaty of Calmar in 1397, Norway, Sweden and Denmark, already under one monarch, Margaret, were formally united into one state. In 1448 the Danes elected as king Christian of Oldenburg, a descendant of their royal family, who was also duke of Schleswig-Holstein; and his line continued on the throne till 1653. Sweden became independent in 1523. Lutheranism was introduced into Denmark in 1537.

In 1515 Denmark had to cede Norway to Sweden; and in 1648 the Germanic peoples of the duchies of Schleswig and Holstein, rebelled against Denmark. For the time the Danes succeeded in retaining the duchies, but the controversy, renewed in 1803, led to the defeat of the Danes by Austria and Prussia (1864), followed by the incorporation of the duchies in the German Confederation, and, after the Austro-Prussian war of 1866, in Prussia.

The most remarkable feature of recent Danish history is the unique parliamentary deadlock originating out of the refusal of the Folkething for nearly twenty years to grant the necessary supplies for fortifying Copenhagen and increasing the national armaments. The Estrup administration, formed for the purpose in 1875, resorted repeatedly to such anomalous expedients as "provisional financial edicts," the majority in the Folkething, who advocated the neutrality of Denmark, retaliated by systematically rejecting every bill laid before them.

Ultimately, however, a large section of the Levee led to abandon to the policy of protest; and in 1893 a new and vigorous political party, which desired parliamentary concord in the agrarian interest, made its influence felt. In April, 1894, the Folkething, for the first time since 1885, not only framed the current budget, but at the same time confirmed nearly all the provisional financial edicts previously issued by the Estrup government.

Since then the principal events of national importance have been a general strike (1900) of 40,000 artisans engaged in the building trades, which paralyzed industry and resulted in the loss to Denmark of \$13,750,000, and the rejection of the proposal (1902) to sell the Danish West Indian islands to the United States.

**References.**—Saxo Grammaticus' *Nine Books of Danish History*; Bain's *Scandinavia*; Sidgwick's *Story of Denmark*; Thomas' *Denmark's Past and Present*.

**Dominican Republic**, or San Domingo, occupies the eastern portion of the island of Hayti. It formerly belonged to Spain and is the oldest colonial settlement in America.

After the discovery of the island in 1492 by Columbus, who named it Hispaniola, it was colonized by the Spaniards, and the larger eastern section remained under Spanish rule until 1844, when independence was gained and the Dominican Republic was formed. Its history during the succeeding twenty-five years is a record of the bitter and often deadly rivalry for the presidency, and of wars with the neighboring republic of Hayti and with Spain.

In 1869 President Baes signed with President Grant a treaty for the annexation of Santo Domingo to the United States. The people of Santo Domingo ratified the treaty, but the United States Senate refused. A revolution in the island republic followed, and in 1886 Gen. Herrez was elected president. In 1899 he was succeeded by President Jimenes, who was defeated by Gen. Vasquez in 1902. There was civil war in 1904 and 1906, and in 1907, a treaty between the Dominican Republic and the United States was ratified, under which the latter will collect the customs revenue, assist the Dominican government to

maintain peace, and act as intermediary between the republic and its foreign creditors.

**References.**—Hazard's *Santo Domingo*; Past and Present; Gladst's *Exposition of Santo Domingo*; Garrison's *The Island of Santo Domingo*.

**Ecuador.**—At the time of the conquest of Peru by the Spaniards Ecuador formed part of the great empire of the Incas. As the presidency of Quito it was long included in the viceroyalty of Peru. From 1710 it became part of the viceroyalty of New Granada (or Santa Fé de Bogotá). In the revolutionary war against Spain, Ecuador, along with the neighboring territories, secured its independence (1822), and was ultimately erected into a separate republic in 1831.

A series of civil wars ensued, lasting almost without intermission for more than twenty years. From 1852 to 1856, desultory hostilities existed with Peru. A war was declared against New Granada, on Nov. 20, 1863, and the Ecuadorian army was routed. In August, 1868, a very destructive earthquake occurred. In 1869, Garcia Moreno, the head of the clerical party, overthrew the government. He was assassinated in 1875 and Dr. Antonio Borrero, the candidate of the non-official party, was elected president. A constitution was adopted and a republic was proclaimed, and until 1884 the republic enjoyed a reasonably peaceful government. In 1884 another constitution was formed, which, with modifications in 1887 and 1897, has since been in force.

**References.**—Keane's *Central and South America*; Whymper's *Travels Amongst the Great Andes of Ecuador*; Orton's *The Andes and the Amazon*.

**Egypt.**—The early history of Egypt is involved in obscurity. The beginning of the continuous civilization of Egypt dates from about 5000 or 7000 B. C. There is no break of continuity of human works from that age, through every generation to the present time, though the continuous written record does not begin till about 5000 B. C.

Pharaohs of Menes, who formed the old empire of Egypt and founded its capital at Memphis, is variously calculated at from 5004 B. C. to 3992. Egypt was in the height of its glory under the nineteenth dynasty, to which Ramesses I. and II. and Memphis (see of the latter, and probably the Pharaoh of Exodus) belonged. In their time all those wonderful structures were raised, and works perfected, which have been beheld without a parallel. These are the pyramids, the labyrinth, the immense grottoes of the Thebais, the obelisks, temples, and pompous palaces; the lake Mooria, and the vast canals, which served both for trade and to render the land fruitful.

The country continued under the Persian yoke till the time of Alexander the Great, who, having conquered Persia, built the city of Alexandria. He was succeeded by Ptolemy, the son of Lagos, 323 B. C. Ten kings of that name succeeded each other, till Cleopatra, the sister of the last Ptolemy, ascended the throne; then Egypt became a Roman province, and continued so till the reign of Omar, the second caliph of the successors of Mohammed, who drove out the Romans, after which he began to build up the empire, and the power of the caliphs declined. Saladin, in 1171, set up the order of the Mamelukes, who usurped the sovereign power in 1260, and extended their dominions over a great part of Africa, Syria, and Arabia.

At the commencement of the sixteenth century Selim, Turkish emperor, conquered it, and for many years it was distracted by the civil wars between the different sects, and by which its provinces were governed. The famous Hassan Ali, the Turkish admiral, gained several victories over them in 1786; but he was afterwards overthrown and subdued them. The French invaded Egypt in 1798, under Gen. Bonaparte, and evacuated the country in 1802.

In 1817, Mehmet Ali became master of Egypt, and the massacre of the Mamelukes, and under his sway it progressed rapidly in civilization. He considerably extended his boundaries, and by the treaty of London (1841) was recognized as the viceroy of Egypt, and Ottoman empire. The independent position of the rulers of Egypt was much enlarged in 1867, by an imperial firman which established the succession of the descendants of Mehmet

Ali, under the title of khedive, or king. Still greater powers were granted in 1872, and in 1874-5 Ismail Pasha, the then ruler, greatly extended the Egyptian territory, annexing the Sudan to Darfur and finally to the shores of Victoria Nyana.

The finances of the country became so involved that the khedive was placed under European management and the country under British and French control. Ismail in 1879 was forced to abdicate and was succeeded by his son Tewfik. A revolt, under Arabi Pasha, of those opposed to the European influence, succeeded.

It was suppressed by the British army and navy, the French taking no part. In consequence, the dual control ended; and since then Great Britain has been the practical ruler of Egypt, despite the occasional protest of France and other European powers.

About 1880 a serious revolt began in the Sudan, under the leadership of the mahdi, a pretended prophet. Efforts to suppress it proved unavailing; in 1883 an army under Hicks Pasha was totally routed, other officers were defeated, and Khartoum, which was held by Sir Gordon, was taken and the gallant officer killed. By these operations Egypt lost the whole of the Sudan, except the equatorial province, held by Emin Pasha till 1888. In 1898 the British gained a strategic position by the explorer Stanley. In 1892 Tewfik died and was succeeded as khedive by his eldest son, Abbas, the British control continuing. In 1898 an expedition for the conquest of the Sudan, set out under British leadership; Dongola was taken in September and the dervish forces were defeated in several engagements.

The predominant position of Great Britain in Egypt was formally recognized by France under the Anglo-French agreement of 1904.

**References.**—Maspero's *Down of Civilization*; Strabo; Lieut. Gordon, *Persa taken and the Petrie's History of Egypt*; Maspero's *The Phoenician Dynasty*; Milne's *Roman Egypt*; Kock's *Egypt in the Middle Ages*; Maspero's *History of Egyptian Archaeology*.

**England.**—Nothing authentic is known of the history of England before 55 B. C., when the island was invaded by Julius Cæsar, who twice invaded the island, and called it Britain. In 55 and 54 B. C. Claudius resumed the idea of subjugating Britain A. D. 43, and from that time until 83, the Roman armies, making further progress, subdued the interior, as far as the Grampian hills, but the northern portion of the island was never subdued by the invaders.

**The Anglo-Saxon Period.**—In 411 Honorius abandoned Britain, whose inhabitants, finding it impossible to defend themselves against the Picts, called to their aid the Saxons, who (449) assisted them so effectually that they took possession of the country and founded the four kingdoms of Essex, Wessex, Sussex, and Kent. The Angles, who followed them, established three other kingdoms, viz., East Angles, Deira, and Mercia (540-564). All these kingdoms ended by being reduced to one, under Egbert, the Saxon king of Wessex (827).

After 835 the Danes ravaged England from time to time, but in 878 Alfred the Great forced them to depart, and from thence till near the end of his reign (900) the Danes left the island in peace. Returning in 981, the Danes succeeded, in 1013, in putting their king, Sweyn, on the throne, who was not recovered by the Saxon dynasty till 1041.

**Norman Conquest.**—When William of Normandy landed in England to claim the crown which his father, the duke of Normandy, had left to him, he found that the people had raised to the throne Harold, the son of a popular nobleman. The resources of the Saxons, however, had been exhausted, and they were forced to be the attack of William; and the battle of Hastings (1066 A. D.) gave England with comparative ease to the Normans. The next twenty years saw the conquest completed, and nearly all the large landed estates of the Saxons pass, on every pretext except the true one, into the hands of the Normans. In the course of time the Normans were absorbed among the Saxons, their very dialect and laws, and thus through leaving many traces. From this union arose the English people and the English language as they now exist. The union of the Normans with the Saxons was not fully

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affected so long as the Normans retained their foreign possessions. At King John's reign the whole of these were lost excepting Guienne and Poitou.

In the reign of Stephen occurred the civil war between the Empress Matilda, daughter of Henry I., and Stephen; she finally retired to France, and concluded a peace with her adversary. The great struggles of the successors of William the Conqueror were with and with the barons. Sometimes in these the popular sympathies were with, and sometimes against, the crown. The Conqueror himself and his immediate successors had no difficulty in maintaining the superiority of the courts of justice over the ecclesiastics; but even a sovereign so bold and skillful as Henry II. was forced, after the murder of Thomas Becket (1170 A. D.) to yield the point. The right to nominate the higher ecclesiastics was also secured by the pope.

**The Plantagenets.**—Under the Plantagenets an era of progress, generally, opened for England. The reign of Henry II. gave to the country the constitution of Clarendon; Ireland was conquered 1171; Edward I. made the most judicious circuits for the better administration of justice, and a digest of the laws was made by Glanville about 1181. Richard I. did little for the internal good of the land, his chief exploits occurring on the field of battle in foreign lands.

**Magna Charta.**—Under John two important events occurred: Magna Charta was obtained, and the French possessions were nearly all lost—both unmitigated blessings; but otherwise John's influence was cast against progress and reform. The degradation of the English monarchy was at its lowest when he consented (1213 A. D.) to hold the crown as a gift from Rome. From Henry II. something similar to the Great Charter had already been granted; but it was the Magna Charta of John which firmly established the great English principles—that no man should suffer arbitrary imprisonment, and that no tax should be imposed without the consent of the council of the nation.

During the reign of Henry III. England obtained her first regular parliament, and gold money was first coined in 1257. Edward I. was crowned 1272. The first year of his reign was the conquest of Wales; Scotland also was subdued, but revolted again in 1297.

The reign of Edward II. was disastrous to himself and to England. The barons rose against his favorites, and Edward was murdered by the connivance of his wife. A new and vigorous era began with the reign of Edward III. The Scots were defeated at Halidon Hill; important victories were gained in France; the Order of the Garter was instituted, and most important of all, law pleadings were ordered to be in English, instead of in the Norman-French tongue, which had hitherto prevailed. Richard II. was crowned 1377, and with his death in 1399 ended the line of the Plantagenets.

The House of Lancaster succeeded in the person of Henry IV. His reign was disturbed by an insurrection of the Welsh under the Percies, but was otherwise peaceful. Henry V. invaded France, won the famous battle of Agincourt, and gained the French crown 1420; but during the reign of his successor, Henry VI., all the French possessions were lost save Calais, which was captured by Warwick the kingmaker, and the first representative of the house of York, Edward IV., was placed on the throne. The wars of the Roses ensued, which continued through the two succeeding reigns of Edward V. and Richard III., ending with the death of Richard on Bosworth field, the coronation of Henry VII., 1485, and his marriage with Elizabeth, daughter of Edward IV.

**The Tudors.**—The union of the houses of York and Lancaster under Henry VII. begins a new period in English history. Henry VIII. succeeded under the motto *Dieu et mon droit*. He found the alliance of his now important country courted by both of his contemporaries, Francis I. and Charles V. But the interest of the foreign complications of the

reign merges in the courts of England and of Rome.

Henry was succeeded by Edward VI. His reign was marked by the general progress which the Reformation made from questions of government to questions of doctrine. The next reign saw the inevitable reaction. The superstitions of the people had been too rudely handled, and, as often happens before a great change comes, a reaction set in, fierce. The conversion of cornfields into sheep-walks, induced by the high value of wool as an article of export, had thrown many out of employment; pestilence, and, moreover, infected with the crowd of vagrants whom the monasteries had been wont to maintain. The popular dissatisfaction coupled these things with the Reformation, and the opportunity was prepared for the atrocities of the reign of Mary.

The accession of the Protestant princess Elizabeth came as a relief to the whole nation. The Romanists themselves were weary of the policy which made England the tool of Spain, and were sickened with the erudites which had been sent. Fortunately for the country, the government of Elizabeth was guided by the able hand of Cecil, was one of peace. The greatest event in her reign was the defeat of the Spanish Armada. On the death of Elizabeth the crowns of England and Scotland were united.

**The Stuarts.**—The reign of James I. does not present much that is remarkable. The plot for which Sir Walter Raleigh suffered long afterward, and the Gunpowder Plot, created a short-lived excitement. Charles I. succeeded to the throne in 1625. The misfortune of Charles I. were the legitimate result of the principles of his father. Charles committed the mistake of repeating in the seventeenth century acts which the Plantagenets and Tudors had done with impunity in the fourteenth and fifteenth. In 1637, when the king found himself involved in a war with Scotland in consequence of his endeavor to alter the liturgy there, he was compelled to call a Parliament. The Commons refused supplies and were again dissolved. In 1640 the king once more summoned a Parliament. His temper of the houses more indomitable than ever.

The Grand Remonstrance (November, 1641) destroyed all chance of a reaction in favor of Charles, and in 1642 war broke out. At first Parliament was worsted, and made an alliance with the Scots. Aided by this alliance, and by the ability of Cromwell and his Ironsides, Charles gave himself up to the Scots, and negotiated with the Parliament. Having been sold to Parliament, Charles was seized by the army, which now stood by itself. Hoping to take advantage of the breach between the Parliament and the army, Charles began intrigues which led to the invasion of England by the Scots on his behalf (the second civil war), and his death in January, 1649, at the hands of Cromwell and his soldiers.

**The Commonwealth.**—The army, now supreme, established a commonwealth, which, under Cromwell, became the Protectorate. Till his death, and after he died 1658, the Commonwealth, though in vain, to govern by means of parliaments. But he was compelled to fall back upon the military force to preserve order, and after he died 1658, the Protectorate of Charles II. became inevitable. In Charles' reign the colonization of New England progressed rapidly.

**The Restoration.**—In 1660, the Stuarts were reestablished, but the errors of James II. brought about a new revolution in 1688, which finally overthrew the Stuart dynasty and gave to the English, as sovereign, William III. of Orange, and as queen, his daughter Mary, daughter of James II. Under Queen Anne, who succeeded him, the union of England and Scotland was consummated, and this union was further illustrated by the victories of Marlborough.

**House of Hanover.**—After the death of Queen Anne (1714), the house of Hanover came to the throne as the nearest heirs of the royal

line, and this family still holds the throne of England. Under this dynasty took place the Seven Years' war (1756 to 1763); the conquest of Canada (1763); the loss of the Anglo-American colonies, now the United States (1776-1783); the French revolution (1789 to 1815); the Irish union (1800); the Russian Revolution (1801); the French and Nonconformist (1820 to 1829); the repeal of the corn laws (1846); the Crimean war against Russia, in concert with France (1854-1856); the Sepoy mutiny, and its prompt repression, in Hindustan (1857-58); and the several expeditions against China (1842 to 1860); the reform bill (1868), and the Fenian and Fenianist (1868-1869) and Abyssinian (1868) wars; the Irish land act (1870); the settlement with the United States of the Alabama claims (1873); the disestablishment of the Irish church; the annexation of the Fiji Islands (1874); the assumption by the queen of the title of empress of India (1876); the Berlin treaty, the acquisition of Cyprus; the fisheries settlements with the United States; the Afghan and Kaffir wars (1878-9); the extension of the franchise (1885), and the Nile expedition (1879).

From 1873 to the present time Irish agitation has been for Great Britain a source of serious disquiet. In 1882 Mr. Gladstone adopted a policy of conciliation, but the murder of Lord Frederick Cavendish and of Mr. Burke caused its abandonment and the immediate passing of a coercion law which virtually placed Ireland under martial law. In 1883 the Egyptian army, under the leadership of Arabi Bey, having revolted from the khedive's authority, Great Britain sent a large naval expedition to Egypt, bombarded Alexandria, and defeated the rebellious forces. Since that date the Egyptian government has been under British suzerainty, and in 1896 a British expedition was sent up the Nile to crush the Mahdists in the provinces of Egypt held by the madist forces.

Within the past quarter of a century Great Britain has largely extended its territory in Africa, bringing great areas in the south and east of the continent under its protection. During the same interval several subjects of dispute have arisen, but the United States, which have all been peacefully settled. An imposing festival took place in London in June, 1897, on the occasion of the sixtieth anniversary of Queen Victoria's accession, the fact that she had reigned longer than any preceding monarch giving the greatest interest and importance to the ceremonies, in which representatives from all sections of the empire took part.

**Boer War.**—October 11, 1899, war was declared by the Boers of the Transvaal and Orange Free State, the aim being the destruction of the British paramountcy in South Africa. This led to the annexation of those states by the British, after a fierce contest, in 1900 and 1902, when the United States elected, which again supported the Conservative ministry, with a slightly increased majority.

**House of Saxe-Coburg.**—Victoria died January 22, 1901, and was succeeded by her eldest son, Edward VII., who proved himself to be an active promotor of peaceful relations with other countries.

The war was concluded in the middle of 1902 by the treaty of Vereeniging, and almost immediately afterward Lord Salisbury retired from office, being succeeded in the premiership by Sir Alfred J. Balfour. The education act of 1902 did away with school boards where they existed, bringing the voluntary and former board schools alike under education committees in England and Wales, and the same change was made in London in 1903. The Irish land act of 1903 was a measure of the first importance, its object being to transfer practically all the agricultural land from the farmers or peasant proprietors. In the autumn of 1903 Mr. Chamberlain resigned office in order to be free to advocate a change in the country's fiscal policy, intended to

unite the colonies more closely with the mother country—a change which many have regarded as meaning a return to protection. Mr. Balfour ended his speech by promising a course in regard to tariff reform, being in favor of preferential tariffs and so-called "retaliation."

In 1904, the introduction of indentured Chinese labor into the Transvaal gold mines aroused much controversy in parliament and the country. The Licensing act of the same year for England and the subsequent fundamental alterations in the tenure of licenses. The question of unemployment having compelled attention, the Balfour ministry passed in 1905 the new unemployment machinery for dealing with distress from this cause. The Aliens act of 1905 should also be mentioned. In foreign affairs the most notable recent events were the Anglo-French agreement of 1904 settling all the outstanding differences between Great Britain and France; and the Anglo-Japanese treaty the following year, extending a similar arrangement of a few years before. The visit of King Edward to Germany in 1906, and of Emperor William to England in the latter part of 1907, did much to secure an amicable understanding between the two powers. The independence of Australia was recognized in 1907.

In April, 1908, Mr. Asquith became premier on the death of Sir H. Campbell-Bannerman. On May 25, 1909, King George V. and Queen Mary were crowned. King Edward was announced, followed by that of his death the next day. His son, George V., succeeded to the throne May 6, 1910.

Europe was probably first peopled from Asia, but at what date we know not. The first authentic history begins in Greece at about 776 B. C. Greek civilization was at its most flourishing period about 430 B. C. After Greece came Rome, which, by the help of the Christian era, had conquered Spain, Greece, Gaul, Helvetia, Germany between the Rhine and the Alps, Illyria, Italy, etc. Improved laws and superior arts of life spread with the Roman empire throughout Europe, and the unity of government was also extremely favorable to the extension of Christianity.

With the decline of the Roman empire a great change in the political constitution of Europe was produced by the universal migration of the northern nations. The Ostrogoths and Lombards settled in Italy; the Franks in France, the Visigoths in Spain, and the Anglo-Saxons in South Britain, reducing the inhabitants to subjection, or becoming incorporated with them. Under Charlemagne (771-814) a great Germanic empire was established, so extensive that the kingdoms of France, Germany, Italy, Burgundy, Lorraine, and Navarre were afterward formed out of it.

About this time the northern and eastern nations of Europe began to exert an influence in the affairs of Europe. The Slaves, or Slavonians, founded kingdoms in Bohemia, Poland, Russia, and the north of Germany; the Magyars appeared in Hungary, and the Bulgarians appeared in Bulgaria. The petty kingdoms and principalities in England, France, Sicily, and the East.

The Crusades and the growth of the Ottoman power are among the principal events which influenced Europe from the twelfth to the fifteenth century. The conquest of Constantinople by the Turks (1453), by driving the learned Greeks from the East, gave a new impulse to letters in western Europe, which was carried onward by the invention of printing, and the Reformation.

The discovery of America was followed by the temporary preponderance of Spain in Europe, and next of France. Subsequently Prussia and Russia gradually increased in territory and strength. The French revolution (1789) and the Napoleonic war had a profound effect on Europe, the dissolution of the old German empire being one of the results.

Since then the most important events in European history have been the establishment of the independence of Greece; the annexation of Poland as a separate state; the unification of Italy under Victor Emmanuel; the Franco-German war, resulting in the consolidation of Germany into an empire (1871).

under the leadership of Prussia; and the partial dismemberment of the Turkish empire.

**France.**—Before the time of Caesar, the whole of France was known to the Romans by the name of Transalpine Gaul; but after its conquest it was divided into the four provinces of *Bretagne* (the Bretons), *Gallia*, *Germania*, *Belgica*. In the fifth century it was subdivided into seventeen provinces, inclusive of all the territory on the east of the Rhine.

At the latter epoch, the Germanic nations began to pour in an irresistible torrent over Gaul; the Visigoths established themselves in the north and south, from the Pyrenees, where they established a kingdom that lasted till about 540. The Burgundians, in a similar manner, settled in the east, from the Lake of Geneva to the Rhine, and afterward stretched along the Rhone to the Mediterranean. The independent sovereignty they erected lasted until about 532.

**Merovingians.**—The Franks, whose dominion swallowed up those of both the foregoing tribes, had been long settled in the north; and Pharamond, their chief in 420, is considered the founder of the French monarchy, as the first of a numerous and powerful race of Frankish kings. In 485 Clovis defeated Syagrius, the Roman general, at Soissons, and finally extinguished the Roman power in the west. In 486, by his victory over the Visigoths, he rendered himself master of all the country between the Loire and the Garonne.

**Division of the Kingdom.**—On the death of Clovis, in 511, his dominions were divided into four kingdoms—those of Paris, Metz, Soissons, and Orleans, each governed by one of his four sons; these, however, were reunited in 558. In 732 Charlemagne defeated the Saracens, who had effected the conquest of a great part of the south of France, and ultimately expelled them from the kingdom.

**Carolingians.**—Under Pepin and Charlemagne the country was relatively peaceful and prosperous; but after the latter's death and the return to their original state of anarchy. Under his immediate successor France was again divided into four parts, and the Normans began to ravage its northern provinces; the power of the nobility also gradually increased; and the last sovereign of the Carolingian dynasty, Louis V., in 986-7, possessed only the town of Laon.

**Capetians.**—His successor, Hugh Capet, count of Paris and Orleans, the founder of the third race of kings, the Capetians, governed only the Ile-de-France, Picardy, and the Orleansais; the dukes of Normandy, Brittany, Aquitaine, Gascony, Lorraine, and Burgundy, the counts of Flanders, Champagne, Vermandois, Toulouse, and several minor seignories, shared among them the rest of the modern kingdom. By degrees, however, all the great fiefs fell in various ways to the crown. Vermandois was united to it by Philip Augustus; Toulouse and Provence, by Louis IX.; Champagne, in 1274; the Lyonnais, Dauphiny, and Languedoc, in the fourteenth century; Berry, Normandy, Gascony, Burgundy, Aquitaine, Maine, and Provence, in the fifteenth; Bourbonnais, Auvergne, Brittany, Lorraine, and considerable territories in the southwest in the sixteenth and seventeenth centuries; the French Comté, and Alsace in the seventeenth century.

**Under the Bourbons.**—While the monarchy gained in consistency and extent, the royal power was making constant advances, the political rights and privileges which the nobles exercised under the feudal system were the objects of continual attacks on the parts of the crown, which, though sometimes defeated, were in most instances successful. At length, under the administration of Richelieu, the nobles were stripped of all power; and there being no other body in the state, with the exception of the clergy, which had degenerated into little else than courts of law—that enjoyed any constitutional privilege, the power of the crown was raised to the highest point of control.

Under the vigorous, and for a lengthened period prosperous, government of Louis XIV.,

the royal prerogative arrived at a maximum. But the close of this reign was eminently unprosperous; and the wars in which Louis had been long engaged, the darkest of which he had imposed on his subjects, and the vast debts he had contracted, produced not only great suffering and misery, but also great discontent.

During the regency and the subsequent part of the reign of Louis XV., abuses of all sorts multiplied on all hands, and were no longer controlled by the darkest of which he had imposed on his subjects, and the vast debts he had contracted, produced not only great suffering and misery, but also great discontent. The abuses that infected the whole frame of society, though destructive of the public interests, were either really advantageous, or believed to be so, to a numerous and powerful class, including the nobility and clergy; and it would have required a mind of a very different order from that of Louis to have frustrated the solicitations, intrigues, and cabals of such powerful parties, and to have safely carried through the reforms that had become indispensable.

**French Revolution.**—At length after a variety of futile expedients had been in vain resorted to, it was resolved, in 1789, to hold a meeting of the States-General, which had not been convened since 1614, for the purpose of necessary changes, and averting a public bankruptcy.

This was the commencement of that tremendous revolution, which cost Louis XV. the crown and his life, and destroyed every vestige of the government and institutions that existed when it broke out. The atrocities committed with respect to the human wild, but not unnatural excesses of an uneducated populace, that had suddenly been emancipated from a state of extreme degradation. The prevailing proscription and anarchy by which the revolution was accompanied continued till Napoleon attained to the supreme direction of affairs. The talents of this extraordinary man were surpassed only by his ambition, which, by overstepping all bounds, precipitated him into enterprises that ultimately led to his overthrow.

**Bourbons Restored.**—In 1814, the Bourbons were restored to the throne, but the elder branch had profited as little as the Stuarts in England under similar circumstances, by the lessons of adversity, and in 1830 they were expelled from the kingdom. The crown was then offered, under certain conditions, to Louis Philippe, Duke of Orleans, by whom it was accepted. He has the credit of having preserved the country, in difficult circumstances, to maintain, for a lengthened period, the peace of France and Europe. But he alienated the public by his plan of having the king to be a private citizen, and by the corruption which pervaded every department of his government.

**Second Republic.**—This led to the revolution of Feb. 24, 1848, and the establishment of the republic, which prevailed over a provisional government. A new constitution having been voted by a "Constituent Assembly" of nine hundred members, Prince Louis Napoleon was elected president of the republic for four years, by 5,562,543 votes, on the 10th of December, 1848. The prince-president dissolved the National Assembly by a coup d'état, and proceeded to remodel the constitution, appealed to universal suffrage, which declared him president for ten years, by 7,439,216 votes, on the 21st of December, 1852.

**Empire Restored.**—By a third vote, Louis Napoleon was chosen Emperor of France, by 7,664,216 against 231,145 votes, on the 2nd of November, 1852. He was crowned Napoleon III., Emperor of the French, on the 1st of December, 1852. The Crimean war

(1854-55) and the war against Austria on behalf of Italy (1859) distinguished the early part of his reign. The latter greatly aided in the foundation of a united Italy, and gave France the territories of Savoy and Nice (1860).

**Franco-Prussian War.**—In 1870 the uneasiness of Napoleon and the French at the steady aggrandizement of Prussia broke out into flame at the offer of the Spanish crown to a prince of the house of Hohenzollern. France, not satisfied with the renunciation of the German prince, demanded a guaranty from the king of Prussia that the candidature should never be resumed. This being refused, France declared war. One French army was driven back by the Prussians, who moved up in Metz, another was pushed northward to Sedan, and so hemmed in that it had to surrender with the emperor at its head.

**Third Republic.**—On the news of this disaster reaching Paris the republic was proclaimed. After an almost uninterrupted series of victories the Germans became masters of the French capital (January 28, 1871), and the war ended in France. The German army occupied Alsace and a part of Lorraine, and paying a war indemnity of five milliards of francs (\$1,000,000,000). Meanwhile civil war had broken out in Paris, which was suppressed with great difficulty. The assembly elected in 1871 for the ratification of peace with Germany found it expedient to continue their functions. Thiers remained at the administration. In 1873 the Thiers administration was overthrown and replaced by one under Marshal MacMahon. In 1875 a republican constitution was adopted. In 1879 MacMahon resigned his presidency before its legal expiry, being succeeded by Jules Grévy, who has been followed by Carnot (successor of Thiers), Sadi Carnot, and Loubet. In 1881 France occupied Tunis as a protectorate; in 1883-4 she extended her influence over Tonkin and Annam; in 1895 she reduced Madagascar to a colony. The alliance with Russia (1895) was followed in 1905 by the *entente cordiale* with Britain; and 1905 saw the disestablishment of the Roman Catholicism in Belgium.

**References.**—The chief histories are those of Henri Martin, Michelet, Duréux, Lavallée, Bismarck, Michelin, Lavigne, and Duréux. The best of the general history of France, see, in addition, Tocqueville's *The Ancient Regime*; Taine's *French Revolution*; Carlier's *History of France*; Rühlmann; Fyffe's *History of Europe*; Hall's *Life of Napoleon Bonaparte*.

**Germany.**—When first, in the fourth century B.C., the Romans heard of new peoples of common kin, whom they called Germans, the German tribes were living between the Elbe and Rhine and to the north of the Main. In 88 B. C. Caesar drove back the Germans who had crossed the Rhine. Successful Roman incursions were made into Germany under Augustus; but in 6 A. D. the German tribes rose under Arminius (Hermann) and utterly destroyed Varus and his legions.

Henceforth the Romans were in the main content to hold a strip of territory from the lower Rhine to the upper Danube, and to guard the frontiers of the empire against German raids. From the third century on this became impossible, and in the fourth, the Germans continued to force their way into Roman territory. By the end of the fifth century they had overrun Gaul, Italy, Spain, and part of Africa. After this Germany itself continued to be a divided state, till it came under the single rule of Charlemagne.

**Empire of Charlemagne.**—The history of the German empire properly commences with the treaty of Verdun (843), which separated the land of the eastern Franks under Ludwig the German from that of the western and central Franks. Out of Ludwig's kingdom was to spring a divided state, nationality. Charles the Fat became emperor in 881, and three years later was also elected king of the west Franks, thus again uniting under one scepter the monarchy of Charlemagne.

After his deposition in 887 the two territories of the eastern and western Franks were again separated, the former electing Arnulf as king. He died in 899, and

was succeeded by his infant son Louis, who was proclaimed king of Lorraine in 900, assumed the title of emperor in 908, and in 911, he designated Louis IV. He died in 911, and the German emperor Conrad, count or duke of Franconia, as his successor. He died in December, 918, of a wound received in battle with the Huns. In 919 Henry the Fowler, duke of Saxony, was elected.

**Holy Roman Empire.**—Henry was succeeded by his son Otto the Great in 936, who revived the title of Charlemagne, received the crown of Holy Roman empire from the pope in 962. He died in 973, and was succeeded by his son Otto II, who had been crowned emperor by the pope in his father's lifetime. Henry II, duke of Bavaria, assumed the Saint, the hereditary heir of the Saxon line, was elected at Mainz, on the death of Otto in 1024, crowned emperor in Rome 1014, and died in 1024. With him ended the Saxon line of emperors.

Conrad II, surnamed the Salic, a Franco-German nobleman, was chosen to succeed him. He spent several years in Italian wars, defeated the Poles, and restored Lusatia to the empire. He died in 1039. He was succeeded by his son Henry III, who had been chosen in his lifetime, and who, the imperial power being now at its highest point, exercised more despotic authority in Germany than any predecessor.

The fruits of his policy were lost by his son Henry IV. (1056-1106), who was passionate and weak. In his reign occurred the famous quarrel of the pope regarding the investiture, which ended in Henry having to humble himself before the pope at Canossa. His life was embittered by contests against rival emperors, and ended by the deposition of his own son Henry to the papal party, by whom he was eventually deposed. Henry V. (1106-25) inherited, however, the quarrel of the investitures, took Pope Paschal II. prisoner, and was excommunicated by several councils. At length the question of investiture was settled by the Concordat of Worms (1122). On his death there was a contested election, and a civil war between Lothair, duke of Saxony, and Conrad of Hohenstaufen, in which the former was successful.

A contest was now begun between the Saxon (Hohenstaufen) and Guelph (Guelph) families, in which the celebrated party names Guelph and Ghibelline originated. On the death of Lothair in 1138 Conrad III. (of Hohenstaufen) was chosen to succeed him. Conrad died in 1152, and was succeeded by his nephew Frederick Barbarossa. His son, Henry VI., began his reign with a war in southern Italy. He conquered Sicily, and was crowned king of it in 1194. He died at Messina in 1197. Philip, brother of Henry, and Otto IV., were elected by rival factions in 1198. On Conrad IV.'s death commenced the long interregnum from 1254 to 1273, which ended in delivering Germany from anarchy.

**House of Hapsburg.**—In 1273 Rudolf I., the first of the Hapsburg line, which still reigns in Austria, began his reign and ended it by destroying the strongholds of the nobles. For the next 200 years, counting from 1292, the period of the accession of Adolfus, the history of the German empire presents few features of interest. In 1493 Maximilian I. succeeded his father, Frederick III., married Mary, daughter of Charles the Bold of Burgundy. He began his reign as the prince of the general politics of Europe, while his opposition to the reformed faith preached by Luther embittered the religious differences between the close of the fifteenth century.

**Charles V.**—Maximilian I. was succeeded by Charles V., the fourteenth sovereign of the house of Austria in 1515, and gloriously resuscitated the grandeur of the empire. Although opposed to Luther, he began his reign as the prince of Germany to settle their religious differences among themselves, and to quell the insurrection of the peasants in 1525, which threatened to overthrow his throne. He abandoned in favor of his brother Ferdinand in 1556, who granted entire toleration to the Protestants.

**Thirty Years' War.**—Ferdinand's reign was marked by domestic and foreign wars, and anarchy, both civil and religious, now ob-

stained in his dominions to such an extent as to culminate in the Thirty Years' war, which closed under Ferdinand III. by the treaty of Westphalia, 1648. This terrible war depopulated the rural districts of Germany, destroyed its commerce, crippled the powers of the emperors, burdened the people with taxes, and cut up the empire into a multitude of petty states; whose rulers exercised almost absolute power.

The reigns of Leopold I., Joseph I., and Charles VI. were occupied with long wars with Russia, Prussia, and Saxony. The death of Charles, in 1740, gave rise to the war of the Austrian succession, which secured the throne to the husband of Maria Theresa, Charles's daughter, and thus placed on the throne a member of the House of Lorraine, in the person of Francis I. Thus the house of Hapsburg-Lorraine, which had succeeded to the hereditary possessions of Austria, was recognized as the head of the empire. After a brief interval took place the Seven Years' war (1756-63), in which Austria, Russia, France, and Saxony combined against Prussia, then ruled by Frederick the Great. The peace of Hubertburg (1763) concluded the war, Prussia retaining her acquisitions.

In 1765 Joseph II. succeeded to the imperial throne. He took the command of his army, co-regent with his mother of the Austrian hereditary dominions. He joined with Russia and Prussia in the first partition of Poland in 1772. His brother, Leopold, who, having died in 1792, was succeeded by his son, Francis II., who joined in 1793 in the second partition of Poland, and took the command of his army against the French in 1794, concluded the peace of Campo Formio with Bonaparte (1797); joined the second coalition against France in 1799. His son, Francis II., who died in 1806, joined the third coalition in 1805, and concluded the treaty of Presburg (1805). In 1804 Francis took the title of emperor of Austria, and thus, after twenty-two years later that of head of the German Empire, which, indeed, had ceased to exist, owing to the conquests of Napoleon.

**Confederation of the Rhine.**—The states of Germany were united by the Treaty of Vienna (1815), in a confederation called the German Confederation (*der Deutsche Bund*). In 1818 a general commercial league, called the Zollverein, was formed by Prussia, and was gradually joined by most of the German states, exclusive of Austria. Revolutionary outbreaks caused great disturbances in various German states in 1830 and 1848, particularly the latter. The German diet was restored in 1851 by the efforts of Prussia and Austria, who were latterly rivals for the supremacy in the confederation.

In 1866 the majority of the diet supported Austria in her dispute with Prussia respecting the disposal of the duchies of Schleswig and Holstein, whereupon Prussia withdrew from the confederation, and declared war. The Seven Weeks' war between Austria and Prussia ended in the defeat of the former, the loss of her Italian possessions, and her exclusion from the German Confederation, which was reformed by Prussia and Austria, the title of the North German Confederation.

**The Present Empire.**—After the Franco-German war in which the South German states, as well as the North German Confederation, supported Prussia, the king of Prussia proclaimed German emperor (William I.) at Versailles on January 18, 1871. The parliament of the empire soon met at Berlin, and adopted the new constitution. William I. was succeeded by his son Frederick, and grandson, William II., in 1888. The war gave Alsace-Lorraine to Germany, which since then has acquired large areas in southwestern and eastern Africa, with a portion of New Guinea, the chief Samoan islands, etc. In recent years the empire soon met at Berlin greatly developed, and the Emperor William II. is bent on making Germany a great naval power.

**References.**—Pittier's *Historical Development of the Constitution of Germany*; Fyffe's *The Holy Roman Empire*; Ranke's *History of the Latin and Teutonic Nations*; and *History of the Reformation in Germany*; Gardiner's *The Thirty Years' War*.

War; Von Sybel's *Foundation of the German Empire*; Hendiam's *Bismarck*; *Bismarck's Memoirs*; Whitman's *Imperial Germany*.

**Greece.**—Before the dawn of history, we have traces of the encroachments on one another by various Hellenic or Greek races, tribes, or alliances—Pelægiæns, Ætolians, Ionians, Boeotians, and Achæians being among them.

**Ancient Greece.** The first thing striking you when you visit Greece is the fact that the historical fact is the invasion from the northward by the Dorians, who made themselves masters of the Peloponnese about the beginning of the twelfth century B. C. A consequence of this Dorian invasion was the colonisation of the islands and of the coasts of Asia Minor by Eolians, Ionians, and later by Dorians also. The seeds of that literature, art, and philosophy which afterward made Greece, and especially Athens, glorious were sown and first nurtured in the colonies.

By degrees Greek colonies established themselves on the shores of the Black Sea, and along both north and south coasts of the Mediterranean, Sicily was largely Hellenized, and South Italy became Magna Græcia.

Neither at home nor abroad had the Greeks the faculty of union as a nation or race; even in the fatherland there were multitudes of small states, a city with three or four miles of territory being often an independent state of itself, and frequently at war with its neighbors. Almost the only central bond of union, besides the Hellenic tongue in its various dialects, was the oracle of Apollo at Delphi.

**Sparta and Athens.**—For long, two Greek states were preëminent. The powerful Dorian state of Sparta was recognized about 800 B. C. by Lycurgus, the kingly institution being re-

Lycurgus, the stingy measurer being retained. Athens was democratic before that date, and its constitution, fixed by Solon in 594 B. C., ultimately triumphed over the tyranny of Pisistratus and his sons. The crachments of the Persians on the Greek colonies of Asia Minor led to the invasion of Greece by the Persians in 490 B. C., an invasion gloriously repelled by the Athenians at Marathon. Xerxes was defeated at Thermopylae, Salamis (480), Plataea, and Mycale. Athenians and Spartans for a time combining their forces.

Now it was that Greek literature and Greek art attained a perfection that has made the rest of the world ever since scholars and imitators of the Greeks of the Periclean period.

The next period is marked by the fratricidal struggle between Athens and Sparta in the Peloponnesian war, which ended in the humiliation of Athens in 404 B. C., and the

**Macedonian Rule.**—In 379-1 the Thebans asserted themselves vigorously against the Spartans; and forty years later Philip of Macedonia subjected Greece to a semibarbarous nation. Under his son, Alexander the Great, the Greek name and the Greek fame were extended into Asia and Africa by the Macedonian king's campaigns.

**Conquest by Rome.**—In 197 the Romans broke the Macedonian power, and by 146 were masters of Greece, which subsequently shared the fortunes of the Roman empire. When the Roman empire was divided (395 A. D.) into the eastern and western empires, Greek was of course the language of the Eastern, Greek, or Byzantine half of the Roman dominion. The Hysazantine emperors fell in 1453 before the Turks, under whom the Greek race reached the lowest stage of political, intellectual, and spiritual and spiritual decadence, though the Greek church survived, and the old Greek tongue, in corrupted guise, continued to be spoken.

**Modern Greece.**—From 1715 till 1821 the Greeks were without intermission subject to the domination of the Turks. A national re-awakening began in 1821; and by 1828, with the support of Britain, France, and Russia, Greece was again a free, but small and weak kingdom. The Russo-Turkish war of 1877-8 added Thessaly and part of Epirus to its area; but the ambition of the Greeks to secure a large share of the "sick man's" inheritance—especially Macedonia and Constantinople—is one of the causes that has led to growing embarrassment in the national finances, and to the national bankruptcy in 1893.

In 1897 an insurrection in Crete led to the interference of the Greeks and to war with Turkey, the result being the speedy defeat of Greece, entailing the payment of a heavy war indemnity, with some loss of territory on the Thessalian frontier.

**References.**—Bickford Smith's *Greece Under King George*; Rodd's *Customs and Lore of Modern Greece*; Mahaffy's *Romances and Studies in Greece*; Toner's *Islands of the Aegean*; Bent's *Cyclades*; Guerber's *The Story of the Greeks*; Finlay's *History of Greece*; Phillips' *The Greek War of Independence*; Miller's *Greek Life in Town and Country*.

**Guatemala.**—A republic of Central America, discovered by Columbus in 1502. A large part of it was conquered by the Spaniards about 1524, and erected into a captain-generalship by the Emperor Charles V. in 1527.

Guatemala, together with the other states of Central America, became independent in 1821. A confederation, which existed from 1824 to 1839, was overthrown by an uneducated but able Indian named Carrera, who founded the present republic and governed it until his death in 1865. General Barrios was president from 1871 to 1885, and under his iron rule the country made much progress. In 1897 Guatemala became a member of a new confederation called the Greater Republic of

**References.**—Brigham's *Guatemala, the Land of the Quetzal*; Niederlein's *The Republic of Guatemala*; Madley's *A Glimpse of Guatemala*.

**Hayti** was discovered by Columbus in 1492. It was then inhabited by perhaps 2,000,000 natives, but so ruthlessly did the Spaniards deal with the aborigines that within a century they practically exterminated them, having introduced negro slaves in their place. In 1630 the French settled in the western part of the island, and in 1697 the western portion was ceded to them, while the eastern remained Spanish.

1791 the negroes revolted against France, and latterly the whole island came under the negro leader Toussaint L'Ouverture, who established an independent republic. He was captured, but in 1803 Desmalines headed a new insurrection, drove out the French, and the emperor Napoleon bought the island. He was reinstated in 1806, but Spain regained the eastern portion of the island. In 1821 the Spanish portion declared itself independent of the mother country, and assumed the name of Spanish Hayti; but it was subjugated by Boyer, the president of the

In 1844 the inhabitants of the Spanish portion rose, and formed themselves into a republic under the name of San Domingo (*República Dominicana*). In 1861 Santana negotiated a reunion of the state with Spain, but Spain evacuated the island in 1865. From that period its history has presented an almost uninterrupted scene of revolution and bloodshed. It now comprises the republic of Hayti on the west side of the island, and the Dominican republic on the east.

**References.**—Pritchard's *Where Black Rules White*; St. John's *Haiti or the Black Republic*; Léger's *Haiti, Her History and Detractors*. See, also, *Index*.

**Honduras**, a republican state of Central America, on the Gulf of Honduras, was discovered by Columbus in 1502, and conquered by one of Cortes' associates in 1523. It joined the republic of Central American states in 1821, and became an independent state in 1838. The present constitution was adopted in 1860. The president, Gen. Santos-Guardiola, was assassinated at Comayagua by Pablo Aguirre, commander of his bodyguard, 1862. Honduras united with El Salvador and Guatemala to elect President Carrera, 1893. Owing to military reverses, President Montes was compelled to take flight, July 26, when José María Medina was provisionally elected in his stead. The President Medina was re-elected in 1899 for a term of four years. He was subsequently shot by his successor, M. A. Soto, was elected in 1870. Policarpo Bonilla was elected president in 1876. Honduras is a member of the League of the Greater Republic of Central America.

**References.**—Lombard's *The New Honduras*; Charles' *Honduras*; Solters's *A Lady's Ride Across Spanish Honduras*; Squier's *Honduras*.

**India.**—The early history of India is obscurely written in the myths of Sanskrit literature.

but the first fact of any certainty is that about the year 2000 B. C., or even earlier, an Aryan people of comparatively high civilization descended from the mountain regions of the northwest into the plains of India and subdued the original inhabitants there.

The expedition of Alexander the Great to the Indus in B. C. 326 gives us a momentary glimpse of that part of India; but between his invasion and the Mohammedan conquest there is little authentic political history of India. In the third century B. C., Buddhism was established throughout India, but it afterward entirely gave way to Islamism. The first six centuries of the Christian era were occupied by struggles between the native dynasties and invaders from the northwest.

**Mohammedan Conquest.**—In the eighth century the tide of Mohammedan influence began with Kasim's advance into Sind (711 A. D.). But the Mohammedans were again driven out in 828, and for more than one hundred and fifty years afterward the strong feudal and tribal organisations of the northern Hindu kingdoms were a barrier to the Mussulma advance. At length, in the year 1001, Mahmud of Ghazni reduced the Punjab to a province of Central Asia, and the Mohammedan power was firmly established in the Punjab and India. In 1398 Timur, or Tamerlane, defeated the sultan (or Mongol) invasion of India, and after sacking Delhi retired into Central Asia.

**the Moguls.**—In 1526 Sultan Baber, a descendant of Tamerlane, founded the Mogul empire in India. His grandson Akbar reigned from 1556 to 1607, and extended his power over most of the peninsula, being distinguished by his justice and his tolerance in matters of religion. He sent a magnificent embassy to the ambassador from James I. in 1615. During the reign of his successor, Shah Jehan, famous for his architectural magnificence, the Marathas began to be formidable in Southern India. In 1674, the Marathas, led by their youngest son Aurengzeb, who made war successfully with the Afghans, the Rajputana tribes, and the rising power of the Marathas. The Sikhs, a Hindu sect, formed a religious and military empire in the Punjab in 1675. On the death of Aurengzeb in 1707 the Mogul empire began to decline, Mohammedan viceroys like the Nizam and the ruler of Oudh asserting their independence, while the great Hindu empires of the Sikhs, the Marathas, and the Marathas began to harass the decaying empire.

**European Colonization.**—The Dutch, Portuguese, and French, as well as the British, established themselves in the empire; in the eighteenth century the French more than rivaled the British in the number of colonies. The British East India company, originally traders, became dominant after the battle of Plassey in 1757. Gradually English power as represented by the company, its diplomats, and its army, came to predominate in all parts of India, and the governors—Clive, Warren, Hastings, Wellesley, Amherst, Bentinck, Dalhousie, Canning—consolidated what was really the empire of Britain in the east. Then in 1857 came the great Sepoy mutiny, which was crushed in blood, and not brought to an end until May, 1858.

**British Colony.**—In 1858 the direct sovereignty of India, and the powers of government hitherto vested in the East India Company, were vested in the British crown. Lord Dalhousie, who had been in India since 1848, was appointed to England early in 1869, and was succeeded by Sir John Lawrence, who died in 1863. Sir John (afterward Lord) Lawrence was governor-general from 1863 to 1868, when he was succeeded by the earl of Mayo, who did much to develop the resources of India, and to remove the restrictions upon trade between the different provinces, and constructing roads, canals, and railways. He was assassinated by a Mohammedan fanatical the Andaman Islands, and was succeeded by the earl of Mayo in 1872. During his administration a famine in lower Bengal (1874), the dethronement of the Gaekwar of Baroda for disloyalty (1875), and the tour of the Prince of Wales through India (1876), were the chief events.



tion of peace signed in 1904 by the most powerful chiefs may lead to their cessation. At the beginning of 1911 negotiations were in progress with the United States for the adjustment of the Liberte public debt, similar to that in force in Santo Domingo.

**References.**—Durham's *The Low Sea of Luzon*; Johnston's *History of the United States*; Liberte's *Liberte* (Washington, 1910).  
**Luxemburg, Grand Duchy of**, a small independent state of western Europe, was ceded to Belgium by the monarch of France, and created a county in 965. In the twelfth century it came into the possession of the counts of Limburg, who took the title of counts of Luxemburg. The Emperor Charles IV. erected it into a duchy in 1354. It came to Philip of Burgundy by his marriage with Isabella, daughter of the king of Portugal, in 1443, and through him passed to the house of Spain, with whom it remained until the peace of the Pyrenees, when part of it was ceded to France November 7, 1659. It was ceded to France by the treaty of Campo Formio, October 17, 1797, and it passed to Holland in exchange for certain German principalities in 1814, and became a grand duchy.

In consequence of the Belgian revolution, Luxemburg was dismembered, and a portion was assigned to Belgium by the conference of London, 1831, and the fresh claims were made in 1839, the king of Holland retaining the title of grand duke of Luxemburg. The grand dukes belong to the Dutch royal family, and the state is governed according to its own constitution. In the treaty of London (1867) it was declared to be neutral territory.

**References.**—Baudouin's *Grand Duchy of Luxemburg*; Coster's *History of Luxemburg*; Farnmore's *In Further Ardennes*.

**Mexico.**—The oldest inhabitants, the Toltecs, by the eighth or ninth century A. D. attained a comparatively high civilization. About the eleventh or twelfth century the kindred but fiercer Aztecs became dominant, and erected on the ruins of the Toltecs a gloomy religious beliefs and bloody rites. Cortes and his Spaniards landed at Vera Cruz in 1519; and the conquest of the empire was creditable to the superiority of the Europeans as it was dishonorable to their humanity. Mexico was long the richest province of Spanish America, and was systematically and mercilessly exploited for the benefit of Spain.

Discontent on the part of the inhabitants, Spanish as well as of mixed blood, broke into open rebellion in 1810, and the capital was surrendered by the last of the viceroys in 1821. Turbide proclaimed himself emperor next year; and after various convulsions and rebellions the federal republic was established in 1823. For the next fifty years the history of Mexico is a mere record of chronic disorder and civil war.

In 1845 Texas was incorporated with the United States; and after the war of 1848, Mexico ceded half a million square miles to the United States. The emperor Napoleon III. declared war against the president, Juarez, in 1862; the Austrian emperor, Maximilian, imposed by the French, was executed in 1867, and the republic reestablished. Under President Diaz, who has been continuously at the head of the government since 1876, the whole energy of the government has been given to the development of railways, mines, and other industries.

**References.**—Bosmer's *The United States*; Howell's *Mexico: Its Progress and Condition*; Pennington's *Butler's Aztec Land*; Kravitz's *The Rise and Fall of the Emperor Maximilian*; Butler's *Mexico in Transition*; Lummis's *The Making of a Nation*; Lummis's *The Making of a Nation*; Southworth's *The Mines of Mexico*; Knox's *Mexico*.

**Monaco**, a city and principality on the Mediterranean, surrounded on all three sides by the French dependency of Alpes-Maritimes, nine miles from Nice, under the protection of France. The city is built on a rocky promontory stretching into the sea. The principality of Monaco passed into the hands of the Genoese house of Grimaldi, about 908. The male branch of the Grimaldi becoming extinct in 1731, the state passed by marriage to the house of Matisson, which assumed the name

of the original family. Mentone and Rocca-bruna having been sold to France in 1661, the principality is now confined to the city of Monaco and the town of Monte Carlo. In 1699, the reigning prince, Charles II., abolished all taxes, his revenue being confined to the rent of the casino, which became notorious as a gambling establishment. He was succeeded by the present prince, Albert, in 1818, who granted a representative government in 1911.

**References.**—Métivier's *Monaco and Its Princes*; Pickering's *Monaco*; Tassie's *Monaco*.

**Montenegro** first appeared as a principality under the name of Zeta in the fourteenth century, and was subject to the great Serbian kingdom till about 1389. In 1510 the present prince abdicated in favor of the Archbishop Vasil, who then formed Montenegro into a theocratic state, under an autocratic vladika or ecclesiastical prince-bishop. The dignity was inherited through brothers and nephews, and after 1697 became hereditary in the family of Petrovitch Njegos. The history of Montenegro for many years is a record of deadly struggles with the Turks, and of a slowly growing civilization among its inhabitants. In 1852 Danilo I. became vladika, but in 1855 he carried, under his ecclesiastical character, the name of the title of border or prince, and transformed his land into a secular principality, the independence of which was soon recognized by Russia. Danilo was assassinated in 1860, and in the present prince, Nicholas I. Petrovitch, became hereditary. In 1861-2 he engaged in a not altogether successful war against Turkey; but in 1876 he joined Serbia and in 1878-9 Russia against his hereditary foe, with the result that 1900 square miles were added to his territory by the treaty of Berlin. In 1909 Montenegro gained complete sovereignty in national affairs.

**References.**—Denison's *Montenegro, Its People and History*; Wray's *Montenegro, The Gates of the Black Mountain*; Miller's *Travels and Politics in the Near East and The Balkans*.

**Morocco** in ancient times formed part of the Phoenician and about 45 B. C. was incorporated in the Roman empire. In the latter part of the seventh century the Arabs spread over North Africa, and took possession of Morocco. Among ruling dynasties since then have been the Almoravids, Almohads, and others. The present dynasty, the ninth, was founded in 1648. In 1814 the slavery of Morocco was abolished and piracy was prohibited in 1817. In 1859-60 there was war with Spain, resulting in a small cession of land and an indemnity to Spain. The conquest of Algeria brought France into troublesome connection with Morocco, and Germany latterly intervened and brought about a European conference in 1906, which instructed France with certain powers. In 1909 the rights of both Germany and France were defined in an additional treaty.

**References.**—Mackin's *Land of the Moors*, and *The Moors on Account of Morocco*; Thomson's *A Journey to Southern Morocco and the Atlas Mountains*; Harris' *Taliter*; Hooker and Moore's *Morocco and the Gambia*; *Travels and Adventures*; Dawson's *Things Seen in Morocco*; *Things Seen in Morocco*.

**Nepal** is a name kingdom of India, on the southern slope of the Himalayas, between Tibet and Bengal, was formerly divided between numerous independent chiefs, until it was united by the Ghoriks in 1768. The aggressions of the latter into the Chinese territory was put a stop to in 1792, and the rajah obliged to make an ignominious peace. The next twenty years were against the British, who, after a two years' war, obliged them, in 1816, to cede all the country between the Sutley and the Kali rivers, and to evacuate the territory of Sikkim. They rendered material assistance to the British in the mutiny of 1857. The present sovereign, Shamsher Jung, acceded in 1881.

**References.**—Widdell's *Nepal*; Widdell's *Nepal*; Widdell's *Nepal*; Widdell's *Nepal*; Widdell's *Nepal*.

**Netherlands, Kingdom of**, the known generally as Holland, has been an independent state since 1815.

**Early History.**—The ancient inhabitants of the country, the Frisians and the Batavians, became subjects or allies of the Romans in the

first century A. D., and so remained till in the fourth century their territories were overrun by the Saxons and Salian Franks. At the end of the eighth century the Low Countries submitted to Charles the Great, and the feudal dukedoms, counties, and lordships were gradually established (the countship of Holland in the eleventh century). In 1384 the earldom of Friesland passed to the Netherlands, Burgundy, and Philip the Good (d. 1450) made the Low Countries as prosperous as any part of his Burgundian state.

**Dutch Republic.**—Charles V. inherited the Burgundian dominions; and under his son, Philip II. of Spain, broke out the bitter quarrel between Holland and Spain, between Dutch Protestantism and persecutions and Spanish tyranny and persecution, which ended in 1581 in the establishment of the Dutch republic as an independent state under William the Silent (of Orange), though the war continued with intervals till 1648, and the Belgian provinces abode by their allegiance to the kings of Spain. In the seventeenth century Dutch commerce, especially at sea, Dutch science, Dutch classical scholarship, Dutch literature and Dutch art attained an eminence hardly afterward equalled.

Under William III. of Orange the rivalry of Holland and England at sea led to the unfortunate wars of 1652-4 and 1664-7. The accession of William III. of Orange to the stadtholdership of the united provinces (1672) proved the salvation of the republic from France; in 1678 Louis XIV. signed the peace of Nimegue. Ten years later William was again the savior of English liberties, and became king of Great Britain and Ireland. On William's death, the united provinces became a pure republic once more; the hereditary stadtholdership was reestablished in 1747; and when French revolutionaries and French armies overran Holland, the Stadholder William V. fled to England, and the united provinces became the Batavian republic.

**Napoleon.**—In 1806 Louis Bonaparte was made king of Holland by Napoleon; and on the fall of Napoleon, the northern, or Dutch (and mainly French) provinces were united with the southern, or Belgian (and purely Catholic), provinces into the ill-assorted kingdom of the Netherlands, under the prince of Orange, in 1815.

**Modern Kingdom.**—In consequence of the Congress of Vienna, William V. was proclaimed king of the Netherlands, as William I. in March, 1815, and recognized as an independent sovereign by all the powers of Europe. Belgium seceded in 1830, and Holland fully recognized the independence of the Belgian kingdom in 1839. King William I. abdicated in 1840. William II., his son, granted a new and more parliamentary constitution in 1848, the upper house being elected by the provincial councils, the lower directly, but by a comparatively limited electorate.

During the reigns of William III. (1840-90) and his daughter Wilhelmina, the present queen, the chief political problems have been (1) colonial, (2) financial, and (3) social reforms. (1) A system of forced native labor, revived and extended by the governor of Java in 1830, and professed but oppressive, was suppressed after a prolonged struggle in 1870. Slavery in the American colonies was abolished in 1843. In 1872 the colonies in Guinea were ceded to Great Britain, the Dutch in returning being awarded free land in Sumatra. (2) The strain of these wars and the example of other countries, led to a protectionist movement, which was checked at the general election of 1905. A income tax was established in 1902. (3) A bitter conflict over denominational versus secular education lasted from 1857 to 1900.

**References.**—Hartog's *History of the People of the Netherlands*; Motley's *Rise of the Dutch Republic*; Motley's *Rise of the Dutch Republic*; E. T. Rogers's *Holland in Stories*; the *Nation's* Series.

**Nicaragua**, a republic of Central America, between the Gulf of Fonseca and the Gulf of Amula, and conquered by Pedro Arias D. Avila, the governor of Panama, in 1522. During the great year of revolution in Central America, 1821, it threw off its allegiance to Spain, and, after a severe and desperate

struggle, gained its independence, and became the second state in the Federal republic of Central America.

On the dissolution of that union, in 1839, Nicaragua became an independent republic, but, like most of the Central and South American republics, it has been the scene of much discord and confusion. The dispute with England concerning the Mosquito territory (1847-58), was settled in favor of Nicaragua; but subsequently, in 1855, the leaders of the opposing parties of Liberals and Conservatives plunged the country into civil war, which ended in the total defeat of the former. In 1897 it joined with its neighboring republics to form the Greater Republic of Central America.

**References.**—Niederslein's *State of Nicaragua*.

**Norway.**—In the earliest times, Norway was divided among petty kings or chiefs (jarls), and its people were notorious for their practical habits. Harold Fair-hair (who ruled from 863 to 933) succeeded in bringing the whole country under his sway, and was succeeded by his son Erick, the saint, who was driven from the throne, which was seized in 938 by his brother, Hak I., who had embraced Christianity in England.

Magnus the Good, the son of St. Olaf and Alfhild, an English lady of noble birth, was called to the throne in 1036; and having in 1042 succeeded also to the throne of Denmark, united both under one monarchy. After his death, the crowns of Norway and Denmark again passed to different individuals. In 1319 the crowns of Norway and Sweden became for a short time united in the person of Magnus V. Eric of Pomerania succeeded, by separate titles, to Norway, Sweden and Denmark, and in 1397 was crowned king of the three kingdoms. Sweden then for a time became a separate kingdom; but the union between Denmark and Norway was drawn closer and closer, and the latter ultimately became a mere dependency of the former.

After the defeat of Napoleon by the allies in 1813 it was arranged in the treaty of Vienna in 1814 that Denmark must give up Norway, and the result was the union of the two countries under the Swedish crown, each remaining practically independent. The union was not unaccompanied by friction, partly owing to the democratic character of the constitution of Norway.

In 1905 Norway demanded a separate consular service, and was being refused. The Storting declared the union with Sweden at an end. Sweden acquiesced on certain conditions, and Norway having (by plebiscite) decided to remain a monarchy, Prince Charles of Denmark was invited to be king, and now (1911) rules as Haakon (or Hak) VII.

**References.**—Bain's *Scandinavia*; Murray's *Handbook for Norway*; Monro's *in Viking Land*; Nassau's *Norway and the Union With Sweden*.

**OMAN** or Muscat (Muskat), an Arab state on the Gulf of Oman, was conquered by the Portuguese under Albuquerque in 1507, but recovered by the Arabs in 1648. In 1708, they acquired possession of the coasts of Laristan and Moghistan, the islands of Kishin and Ormus, and the town of Bender Abbas in Persia, paying to the shah a rent or tribute of 6,000 tomans. The state was very prosperous under the wise and mild sway of Said Bek, who succeeded to the throne in 1803 and reigned till his death in 1856. In 1854, the Imams were driven from their Persian dependencies, which in their opinion belonged to them as perpetually as long as they paid the rental. They recaptured Bender Abbas, but in consequence of English interference, they were compelled to conclude a treaty with Persia in 1856. Said appointed his son Majid to succeed him in Zanzibar, and his son Thuwayb to succeed him in Muscat. The latter was murdered by his son Salim in 1869, who reigned for a short time, but was driven out by the ruler of Zanzibar, Tukay. In consequence of the unsettled state of affairs in Muscat, Persia assumed the government of Bender Abbas and the Persian coast to remain practically on the footing of an independent Indian native state, and essentially under British protection.

**Reference.**—Gobian's *Three Years in Asia*.

**PANAMA**, a republic occupying what was formerly called the Isthmus of Darien, was formerly a department of Colombia. It asserted its independence in 1903, and for a few years, when it was recognized by the United States, and has since been by the chief European powers.

Under Spanish rule the Panama territory formed part of the province of New Granada, which in 1718 became a viceroyalty. The isthmian territory was organized as a province under the viceroy. Before the close of the war of independence, New Granada, Ecuador, and Venezuela constituted themselves the Republic of Colombia (1819). In 1822 the province of Quito was liberated from the Spanish yoke. Soon there were three republics, Venezuela, Ecuador, and Quito, separating from New Granada (1829-31). Each of the states of the republic of New Granada, as the name indicates (United States of New Granada), was theoretically sovereign, with a limited range of activity assigned to the central government, with its seat at Bogotá.

Through successive usurpations, the powers of the central government were increased at the expense of the separate states. This tendency was partially checked by the adoption of a new constitution in 1858, and under the constitution of 1863, which was adopted after a protracted period of civil war, the autonomy of the states of Colombia (by which name the republic was now known) appeared to be assured. In the late seventies continuing tenacity against federal control, and after an ineffectual resistance on the part of the supporters of local autonomy, a new constitution was promulgated in 1886 which reduced the states to the rank of administrative departments, with governors appointed from Bogotá.

Panama suffered severely under the new régime. The development of trade, owing to the opening of the Panama railway in 1881, led to the importation of a French company, made this part of Colombia an exceptionally lucrative field for the corrupt operations of the government. Heavy taxes were levied upon Panama, and large bodies of Colombian soldiers were garrisoned in its territory to suppress the conspiracies which were constantly being formed against the government. From 1887 to 1890 several insurrections occurred, but were put down by the Colombian forces.

November 18, 1903, a treaty between the United States and Panama was signed, providing facilities for the construction and maintenance of the interoceanic canal. In this treaty, Panama grants in perpetuity the use of a zone five miles wide on each side of the canal route, and within this zone the exclusive control for police, judicial, sanitary and other purposes. For subsidiary canal or other territory is ceded, and for the defense of the canal, the coasted, and the islands in Panama bay are also ceded. The cities of Panama and Colon remain under the authority of the new state, but complete jurisdiction is granted to the United States in both the cities and in their harbors in all that relates to sanitation and quarantine. In return for these grants the United States paid \$10,000,000. The ratification of the treaty, and will pay \$250,000 yearly, beginning after nine years.

The treaty was ratified February 23, 1904, and in July, 1904, the provisional delimitation of the boundaries of the United States territory on the isthmus was signed. According to this agreement the city of Panama is, for all practical purposes, left without a single foreign consular agent, and the commerce of the city is concentrated at the wharf at Balboa, now called "Port Ancón," so far as ocean-going vessels are concerned, but the jurisdiction is granted to the same. Moreover, a similar port has been opened on the Atlantic entrance to the canal, called "Cristobal."

A treaty for the denaturation of the boundary between Panama and Costa Rica was signed on behalf of the respective governments on March 25, 1905, and ratified by Panama on January 10, 1907.

**References.**—Church's *The Republic of Panama*; Cornish's *The Panama Canal*; Johnson's *Four Years in the Canal Zone*.

**PARAGUAY**, a South American republic, was discovered by Juan Dias de Solis in 1515, and settled as a province of the viceroyalty of Peru in 1535. The warlike Guaranis long successfully resisted the Spanish arms. In the seventeenth century the Jesuits, who had been placed in the Jesuits' hands the entire administration, evil as well as religious. From this time forward the progress of civilization as well as of Christianity was rapid.

On the expulsion of the Jesuits from Paraguay in 1768, the province was again made subject to the Spanish viceroys. In 1810 Paraguay joined with other states in declaring its independence. In 1814 Dr. Francia was proclaimed dictator, and exercised absolute power till his death in 1840. In 1865-70 the Paraguayans made a heroic but unavailing fight against the combined forces of Brazil, the Argentine confederation and Uruguay, closed by the defeat and death of the president, López, at the battle of Cerro Cora. In 1870 the Paraguayan report indicated marked national prosperity.

**References.**—Bourgeois in Cardy's *Paraguay*; Mulhall's *Handbook of the River Plate Republics*; Bryce's *South American Republics*; Washburn's *History of Paraguay*.

**PERSIA.**—The earliest account we possess of Persia is from the bible, from which we learn that in the thirteenth century Abraham, about 1921, that portion of modern Persia known as Elam, or Susiana, southern Persia, was a powerful monarchy. But as Persia, as a nation, first rose into notice on the ruins of the great empire founded on the Euphrates. Babylon was taken by Cyrus, and his empire extended wider than any of his predecessors in the world. It comprised on one side, the west of India; on the other, Asia Minor, Syria, and Egypt; and was only bounded by the prodigies of valor with which the Greeks defended their sacred territory. After a long struggle, it succumbed to the brave and disciplined armies of Alexander. It was then split into fragments by the decease of its founder; but the struggle for empire continued during several centuries, to reign over Asia.

About two centuries before Christ, Araces founded the monarchy of the Sassanians; and in the third century, after the dynasty of the Sassanids, who restored the name, with the religion and laws, of ancient Persia. They were overthrown by the Mohammedan invaders, who suffered in their turn from the successive invasions by the descendants of Genghis, Timur, and by the Turks, who entirely changed the aspect of western Asia. At length, in 1501, a native dynasty again arose under Ismail, who placed himself on the throne. His posterity having sunk into voluptuousness, Persia was overrun by the Afghans, who carried fire and sword through its remotest extremities, and reduced its proudest capitals to ashes. The atrocities of the Afghans were avenged, and the independence of Persia vindicated by Nadir Shah, who, after a short reign, was succeeded by his son, who threw a luster on his country, after his death it was almost torn to pieces by civil war, till the fortune of arms gave a decisive result to the contest, and Karim Khan. His death gave rise to another disputed succession, with civil wars as furious as before. At length, in 1794, Aga Muhammed, a eunuch, raised himself, by crimes and daring, to the sovereignty, and he completely swayed it during his lifetime, but founded the present dynasty.

Under his reign, Persia had wars with Russia in 1804 and 1828, and with England in 1856-7. Under the Berlin treaty in 1878, Persia acquired from Turkey the territory and city of Khotur. In 1881 the northeastern frontier was settled by a treaty between Russia and Persia, by which the former gained a fertile district of considerable strategic importance. In 1896 the shah, Naser-ed-Din, was assassinated at Teheran. Mirza Abbas Mirza, a eunuch, came to the throne in his country, 1907. Subsequently the shah broke his pledges, limiting the powers of the sovereign, and revolution ensued. He was

thereupon compelled to abdicate in 1909, and was succeeded by Ahmad Shah, his son. A new cabinet was formed in 1910.

**References.**—Rawlinson's *Conquest of Persia*; Rawlinson's *Five Great Monarchies of the Ancient Eastern World*; Dunsen's *History of Antiquity*; Kershner's *Studies in Ancient Persian History*; Jackson's *Persia, Past and Present*.

**Peru.**—Of the early history of Peru we are almost entirely ignorant, but existing ruins, spoils secured by the Spaniards, and the descriptions left us by the historians of the Spanish conquest, sufficiently prove that the ancient Peruvians had no mean knowledge of architecture, sculpture, metal work, etc. They also had made considerable progress in astronomical science. The early religion of the Peruvians is bounded up in the god Viracocha, the creator of the sun and the stars, and from him the Incas or emperors claimed descent as the sons of the sun.

Under the Incas the empire was divided into four parts, corresponding to the four cardinal points; each division had a separate government, presided over by a viceroy of royal blood. All the land belonged to the Incas; and trade was carried on by barter, money being unknown. The thirteenth monarch of the Incas was reigning when the Spanish adventurer Pizarro disembarked in Peru in 1531. The Incas was taken prisoner (1532), numbers of his subjects were massacred, and the whole country fell in a short time into the hands of the invaders. It was then formed into a Spanish viceroyalty; subsequently part of it was incorporated in New Granada, and the viceroyalty of Buenos Ayres was constructed out of some of the provinces.

In 1821 the country proclaimed its independence, but did not obtain actual freedom

from Spanish rule until 1824, after a prolonged war. Peru, like the rest of the South American republics, has suffered much from dissensions and revolutions. In the spring of 1879 it joined Bolivia in a war against Chile, resulting in the complete defeat of both the former. Peru had to cede by the peace of 1883 the province of Tarapaca absolutely to Chile, which also got possession provisionally of the department of Tacna. Since then Peru, though little troubled with external complications, has been disturbed by the ambitions of rival politicians and even civil war. In 1909, a large national loan was obtained from France.

**References.**—Markham's *Peru, History of*; *Peru and the War Between Peru and Chili*; Bates's *Central and South America*; Evans's *From Peru to the Pole*; Clark's *Tuamotus in Peru*; Middendorf's *Peru*; Wright's *The Old and New Peru*.

## BISHOPS AND POPES OF ROME

PONTIFF	PONTIFICATE	SURNAME	NATIONALITY	PONTIFF	PONTIFICATE	SURNAME	NATIONALITY
<b>First Century</b>				<b>Seventh Century</b>			
St. Peter.....	A. D. 41-67			Gregory I. "The Great".....	A. D. 590-604	Roman.	
Linus.....	67-79		Tuscan.	Sabinianus.....	604-606	Roman.	
Cletus or Anacleus.....	79-91		Greek.	Boniface III.....	607	Roman.	
Clement.....	91-100			Boniface IV.....	608-615	Native of Abruzzi.	
<b>Second Century</b>				<b>Eighth Century</b>			
Evaristus.....	100-109		Greek.	Deudedit I.....	615-618		
Alexander I.....	about 109-119		Roman.	Boniface V.....	619-625	Native of Capri.	
Soter I.....	119-128		Greek.	Marinianus.....	625-638	Roman.	
Telesphorus.....	128-139			Severinus.....	638-640	Native of Dalmatia.	
Hyginus.....	139-142		Athenian.	John IV.....	640-642		
Pius I.....	142-157		Native of Aquileia	Thodore.....	642-649	Greek.	
Anicetus.....	157-168		Syrian.	Martin I.....	649-653	Native of Tuder.	
Soter.....	168-178		Greek.	Eugenius I.....	654-657	Roman.	
Eleutherus.....	177-190		Greek.	Vitalianus.....	657-672	Native of Signa.	
Victor I.....	190-202		African.	Deodatus II.....	672-676	Roman.	
<b>Third Century</b>				Donus I.....	676-678	Roman.	
Zephyrinus.....	202-217		Probably Roman.	Agathon.....	678-681	Sicilian.	
Callixtus I.....	217-222		Roman.	Leo II.....	682-683		
Urban I.....	222-230		Roman.	Benedict II.....	684-685	Roman.	
Pontianus.....	230-235		Roman.	John V.....	685-686	Native of Byria.	
Antherius.....	235-236		Greek.	Comon.....	686-687	Thrace.	
Pabianus.....	236-239			<b>Ninth Century</b>			
Cornelius.....	251-253			Sergius II.....	687-701	Native of Palermo.	
Lucius I.....	253-254		Roman.	John VI.....	701-705	Native of Greece.	
Steven I.....	254-257		Roman.	John VII.....	705-707	Greek.	
Sixtus II.....	257-258		Greek.	Sisinnius.....	708	Syrian.	
Dionysius.....	259-268		Uncertain.	Constantine I.....	708-715		
Felix I.....	269-274		Dalmatian.	Gregory III.....	715-731	Roman.	
Caius.....	275-283			Gregory III.....	731-741	Syrian.	
<b>Fourth Century</b>				Zacharias.....	741-752	Greek.	
Marcellinus.....	296-304		Roman.	Steven II.....	752-757		
Marcellus I.....	304-309		Roman.	Paul I.....	757-767	Roman.	
Eusebius.....	309		Greek.	Steven III.....	768-773	Sicilian.	
Melchades.....	310-314		African.	Adrian I.....	772-795	Roman.	
Sylvester I.....	314-335			<b>Tenth Century</b>			
Marcus.....	336		Roman.	Leo III.....	795-816	Roman.	
Julius I.....	337-353		Roman.	Steven IV.....	816-817	Roman.	
Liborius.....	353-366		Roman.	Paolus I.....	817-824	Roman.	
Damasus I.....	366-384		Spaniard.	Eugenius II.....	824-827	Roman.	
Siricius.....	384-398		Roman.	Valentinus.....	827	Roman.	
Anastasius I.....	398-401		Roman.	Gregory IV.....	827-844	Roman.	
<b>Fifth Century</b>				Sergius II.....	844-847	Roman.	
Innocent I.....	401-417		Native of Albano	Leo IV.....	847-855	Roman.	
Zotus.....	417-418		Greek.	Benedict III.....	855-858	Roman.	
Boniface I.....	418-422		Roman.	Nicholas I.....	858-867	Roman.	
Celestine I.....	422-432		Roman.	Adrian II.....	867-872	Roman.	
Sixtus II.....	432-440		Roman.	Leo V.....	872-882	Roman.	
Leo I. "The Great".....	440-461		Roman.	Martin II.....	882-884		
Hilarius.....	461-468		Native of Sardinia.	Adrian III.....	884-885	Roman.	
Simplicius.....	468-483		Native of Tibur.	Steven V.....	885-891	Roman.	
Felix II.....	483-492		Native of Tibur.	Formosus.....	891-896	Bishop of Porto.	
Gelasius.....	492-496		Roman.	Boniface VI.....	896		
Anastasius II.....	496-498		Native of Africa.	Steven VI.....	896-897	Roman.	
<b>Sixth Century</b>				Romanus.....	897		
Symmachus.....	498-514		Roman.	Thodore II.....	897		
Horimidas.....	514-523		Native of Sardinia.	John IX.....	898-900	Native of Tibur.	
John I.....	523-526		Native of Frusino.	Benedict IV.....	900-903	Roman.	
Felix III.....	526-530		Native of Beneventum.	Leo V.....	903	Native of Ardea.	
Boniface II.....	530-532		Roman.	Sergius III.....	904-911	Roman.	
John II.....	532-535		Roman.	Anastatus III.....	911-913	Native of Sabina.	
Agapetus I.....	535-536		Roman.	Leo VI.....	913-914	Roman.	
Sylvester.....	536-537		Native of Campania.	John X.....	914-929	Roman.	
Vigilius.....	537-555		Roman.	Steven VII.....	929-931	Roman.	
Sixtus III.....	555-560		Roman.	John XI.....	931-936	Roman.	
John III.....	560-574		Roman.	Leo VII.....	936-939	Roman.	
Benedict II.....	575-579		Roman.	Steven VIII.....	939-942		
Pelagius II.....	579-590		Roman.	Martin III.....	942-946		
				Agapetus.....	946-955		
				John XII.....	955-964	Ottaviano Conti. He was the first who changed his name on his elevation.	



## BISHOPS AND POPES OF ROME Continued

PONTIFF	PONTIFICATE	SURNAMA	NATIONALITY	PONTIFF	PONTIFICATE	SURNAMA	NATIONALITY
Tenth Century—Cont.				Fourteenth Century—Cont.			
A. D.				A. D.			
Benedict V....	964	.....	Roman.	Clement VI....	1342-1352	Pierre Roger.....	Native of La-moque, France.
John XIII....	965-972	.....	Roman.	Innocent VI....	1352-1362	Steven Aubert.....	Native of La-moque.
Benedict VI....	973-974	.....	(Cont.).....	Urban V....	1362-1370	William of Grimoard.....	Frenchman.
Benedict VII....	974-983	.....	(Anti-Pope.).....	Gregory XI....	1370-1378	Peter Roger.....	Frenchman.
John XIV....	983-985	.....	Francisco.	Urban VI....	1378-1389	Bartholomew Prignano	Neapolitan.
Boniface VII....	985	.....	Roman.	Boniface IX....	1389-1404	Pietro Tomarelli.....	Of Naples.
John XV....	985-996	.....	Roman.	Fifteenth Century			
Gregory V....	996-999	.....	Calabrian.	Innocent VII....	1404-1406	Angelo Migliorini.....	Native of Sulmona.
John XVII....	997	.....	Philagathus.	Gregory XII....	1406-1415	Cosmo Cornaro.....	Native of Venice.
Eleventh Century				Martin V....	1415-1431	Otto Colonna.....	German.
Sylvester II....	999-1003	.....	Native of Au-vergne.	Eugenius IV....	1431-1447	Gabriele Condolmero.....	Venetian.
John XVIII....	1003-1009	.....	Roman.	Nicholas V....	1447-1455	Cardinal Thomas.....	Naples.
Bergerius IV....	1009-1012	.....	Of.	Callistus III....	1455-1458	Alfonso Borgia.....	Spanish.
Benedict VIII....	1012-1024	.....	Roman.	Pius II....	1458-1464	Ennio Sylvius Piccolomini.....	Tuscan.
John XIX....	1024-1033	.....	Theophylactus.	Paul II....	1464-1471	Pietro Barbo.....	Native of Venice.
Benedict IX....	1033-1044	.....	Of Tuscany.	Status IX....	1471-1484	Francesco della Rovere	Genoese.
Sylvester III....	1044	.....	(Anti-Pope.).....	Innocent VIII....	1484-1492	Giovanni Battista Cibo	Genoese.
Gregory VI....	1045-1046	.....	Giovanni Brasavola.....	Alexander VI....	1492-1503	Rodrigo Lenzini Borgia	Spanish.
Clement II....	1046-1047	.....	Switzer.	Sixteenth Century			
Damasus II....	1048	.....	Poppo.	Pius III....	1503	Francesco Todeschini	Born at Siena.
Leo IX....	1048-1054	.....	Bishop of Toul.	Julius II....	1503-1513	Guiliano della Rovere.	Son of Lorenzo
Victor III....	1054-1057	.....	Abbot of Monte Cassino.	Leo X....	1513-1521	Giovanni de' Medici.....	the Magnificent.
Steven IX....	1057-1058	.....	Abbot of Monte Cassino.	Adrian VI....	1521-1523	Giulio de' Medici.....	Nephew of Lorenzo.
Nicholas II....	1058-1061	.....	Native of Burgundy.	Clement VII....	1523-1534	Alessandro Farnese.....	Roman.
Alexander II....	1061-1073	.....	Native of Milan.	Paul III....	1534-1549	Giovanni Maria Ghislieri	Born at Arezzo.
Gregory VII....	1073-1085	.....	Hildebrand.....	Julius III....	1549-1555	Cardinal Cervini.....	Native of Montepulciano.
Urban III....	1086-1087	.....	Native of Benevento.	Marcellus II....	1555	Gianpietro Carafa.....	Neapolitan.
Victor II....	1088-1099	.....	Otho or Endo.....	Paul IV....	1555-1559	Giovanni Angelo Medici.....	Native of Milan.
Twelfth Century				Pius V....	1559-1565	Michele Ghislieri.....	Native of Alessandria.
Pascal II....	1099-1118	.....	Native of Tuscany.	Gregory XIII....	1572-1585	Odo Buoncompagni.....	Bologna.
Gelasius II....	1118-1119	.....	Native of Caleta.	Sixtus V....	1585-1590	Felice Peretti di Montalto.....	Born near Montalto.
Callistus II....	1119-1124	.....	Native of Burgundy.	Urban VII....	1590	Gian Battista Castagna	Genoese.
Honorius II....	1124-1130	.....	Cardinal Lambert.....	Gregory XIV....	1590-1591	Nicola Staudate.....	Native of Cremona.
Innocent III....	1130-1143	.....	Tuscan.	Innocent IX....	1591	John Antonio Facchetti.....	Native of Bologna.
Celestine II....	1143-1144	.....	Native of Bologna.	Clement VIII....	1591-1605	Ippolito Aldobrandini.....	Native of Fano.
Lucius II....	1144-1145	.....	Native of Pisa.	Seventeenth Century			
Eugenius III....	1145-1153	.....	Roman.	Leo XI....	1605-1621	Alessandro de' Medici.....	Native of Florence.
Anastasio IV....	1153-1154	.....	Gregorian.	Paul V....	1621-1623	Camillo Borghese.....	Native of Rome.
Adrian IV....	1154-1159	.....	Irishman.	Gregory XV....	1623-1623	Alessandro Ludovisi.....	Bologna.
Alexander III....	1159-1181	.....	Cardinal Orlando Bandinelli.....	Urban VIII....	1623-1644	Maffeo Barberini.....	Florentine.
Lucius III....	1181-1185	.....	Cardinal Ubaldo.....	Innocent X....	1644-1655	Giov. Battista Faldini.....	Roman.
Urban III....	1185-1187	.....	Uberto Crivelli.....	Alexander VII....	1655-1667	Fabio Chigi.....	Native of Siena.
Gregory VIII....	1187	.....	Native of Benevento.	Clement IX....	1667-1669	Giulio de' Hospignoli.....	Native of Pistoia.
Clement III....	1187-1191	.....	Bishop of Freneste.	1669-1678	Innocent XI....	Emilio Altieri.....	Native of Rome.
Celestine III....	1191-1198	.....	Cardinal Hyacinthus.....	1678-1689	Alexander VIII....	Benedetto Odescalchi.....	Native of Como.
Innocent III....	1198-1216	.....	Native of Signa.	1689-1691	Innocent XII....	Pietro Ottoboni.....	Native of Venice.
Honorius III....	1216-1227	.....	Roman.	1691-1700	Eighteenth Century		
Gregory IX....	1227-1241	.....	Native of Anagni.	Clement XI....	1700-1721	Gian Francesco Albani.....	Native of Pesaro.
Celestine IV....	1241	.....	Native of Milan.	Innocent XIII....	1721-1724	Michael Angelo Conti.....	Native of Rome.
Innocent IV....	1243-1254	.....	Stibaldo de' Fieschi.....	Benedict XIII....	1724-1730	Vincenzo Maria Orsini.....	Native of Rome.
Alexander IV....	1254-1261	.....	Cardinal Rinaldo Conti.....	Clement XII....	1730-1740	Lorenzo Corsini.....	Native of Florence.
Urban IV....	1261-1264	.....	James, Patriarch of Jerusalem.....	Benedict XIV....	1740-1758	Prospero Lambertini.....	Native of Bologna.
Clement IV....	1265-1268	.....	Guy Foulques.....	Clement XIII....	1758-1769	Carlo Rezzonico.....	Native of Venice.
Gregory X....	1271-1276	.....	Tebaldo Visconti.....	Clement XIV....	1769-1775	Giovanni Venerio Antonio Ganganello.....	Born near Rimini.
Innocent V....	1276	.....	Native of Languedoc.	Pius VI....	1775-1799	Angelo Braschi.....	Native of Cesena.
Adrian V....	1276	.....	Native of Savoy.	1800-1823	1823-1829	Gregorio Barnaba Chigi.....	Native of Cesena.
John XXI....	1276-1277	.....	Genoa.	1829-1830	1830-1846	Annibale della Ghera.....	Native of Romagna.
Nicholas III....	1277-1281	.....	Native of Lisbon.	Gregory XVI....	1846-1878	Cardinal Castiglioni.....	Native of Cingoli.
Martin IV....	1281-1285	.....	Native of Rome.	Pius IX....	1878-1903	Mauro Cappellari.....	Native of Belluno.
Honorius IV....	1285-1288	.....	Frenchman.	Leo XIII....	1878-1903	Giovanni Maria Mastai Ferretti.....	Native of Sinigaglia.
Nicholas IV....	1288-1292	.....	Cardinal Simon de Brie.	Pius X....	1903	Gioacchino Pecci.....	Native of Carpineto.
Celestine V....	1294	.....	Cardinal James Bevelly.			Giuseppe Sarto.....	Native of Venice.
Boniface VIII....	1294-1303	.....	Cardinal Jerome.....				
Fourteenth Century							
Benedict XI....	1303-1304	.....	Native of Anagni.				
Clement V....	1305-1314	.....	Native of Tuscany.				
John XXII....	1316-1334	.....	Native of Bordeaux.				
Benedict XII....	1334-1342	.....	Native of Cahors in France.				
			Frenchman.				



# RULES OF THE WORLD

ROMAN EMPERORS				ROMAN EMPERORS—Continued			
NAME	Period of Rule	Birth	Death	NAME	LIFELINE, ETC.	Period of Rule	Death
THE CESARS				LIFELINE, ETC.			
Augustus.....	A.C. 14	B.C. 63	14	Antoninus.....	Son-in-law of Emperor Marcian.....	407-422	A.D. 407
Tiberius.....	A.D. 14	42	37	Olybrius.....	Made Emperor through influence of his wife.....	422-423	423
Caligula.....	37-41	12	41	Nervus.....	Proclaimed Emperor by order of the Senate.....	423-425	425
Claudius.....	41-54	A.D. 37	54	Proclaimed Emperor by order of the Senate.....	425-426	426	426
Nero.....	54-68	B.C. 37	68	Romulus Augustulus.....	Assumed the throne and abdicated by his mother.....	475-476	476
Galla.....	68-69	A.D. 68	69				
Other.....	69-70	69	69				
Vespasian.....	70-79	70	79				
Titus.....	79-81	81	81				
Dominian.....	81-96	81	96				
THE FIVE GOOD EMPERORS				KINGS, EMPERORS, AND PRESIDENTS OF FRANCE			
Proclaimed Emperor.....	96-108	96	108	LIFELINE, ETC.			
Other.....	108-117	108	117	THE MEROVINGIANS			
Proclaimed Emperor.....	117-132	117	132	Pharamond.....			
Other.....	132-161	132	161	Merovius.....			
Proclaimed Emperor.....	161-180	161	180	Childeric.....			
Other.....	180-193	180	193	Childeric I.....			
Proclaimed Emperor.....	193-217	193	217	Childeric II.....			
Other.....	217-218	217	218	Childeric III.....			
Proclaimed Emperor.....	218-222	218	222	Childeric IV.....			
Other.....	222-235	222	235	Childeric V.....			
Proclaimed Emperor.....	235-238	235	238	Childeric VI.....			
Other.....	238-244	238	244	Childeric VII.....			
Proclaimed Emperor.....	244-249	244	249	Childeric VIII.....			
Other.....	249-254	249	254	Childeric IX.....			
Proclaimed Emperor.....	254-258	254	258	Childeric X.....			
Other.....	258-268	258	268	Childeric XI.....			
Proclaimed Emperor.....	268-270	268	270	Childeric XII.....			
Other.....	270-276	270	276	Childeric XIII.....			
Proclaimed Emperor.....	276-277	276	277	Childeric XIV.....			
Other.....	277-283	277	283	Childeric XV.....			
Proclaimed Emperor.....	283-284	283	284	Childeric XVI.....			
Other.....	284-303	284	303	Childeric XVII.....			
Proclaimed Emperor.....	303-306	303	306	Childeric XVIII.....			
Other.....	306-310	306	310	Childeric XIX.....			
Proclaimed Emperor.....	310-313	310	313	Childeric XX.....			
Other.....	313-317	313	317	Childeric XXI.....			
Proclaimed Emperor.....	317-321	317	321	Childeric XXII.....			
Other.....	321-323	321	323	Childeric XXIII.....			
Proclaimed Emperor.....	323-324	323	324	Childeric XXIV.....			
Other.....	324-325	324	325	Childeric XXV.....			
Proclaimed Emperor.....	325-326	325	326	Childeric XXVI.....			
Other.....	326-327	326	327	Childeric XXVII.....			
Proclaimed Emperor.....	327-328	327	328	Childeric XXVIII.....			
Other.....	328-329	328	329	Childeric XXIX.....			
Proclaimed Emperor.....	329-330	329	330	Childeric XXX.....			
Other.....	330-331	330	331	Childeric XXXI.....			
Proclaimed Emperor.....	331-332	331	332	Childeric XXXII.....			
Other.....	332-333	332	333	Childeric XXXIII.....			
Proclaimed Emperor.....	333-334	333	334	Childeric XXXIV.....			
Other.....	334-335	334	335	Childeric XXXV.....			
Proclaimed Emperor.....	335-336	335	336	Childeric XXXVI.....			
Other.....	336-337	336	337	Childeric XXXVII.....			
Proclaimed Emperor.....	337-338	337	338	Childeric XXXVIII.....			
Other.....	338-339	338	339	Childeric XXXIX.....			
Proclaimed Emperor.....	339-340	339	340	Childeric LXXXX.....			
Other.....	340-341	340	341	Childeric LXXXXI.....			
Proclaimed Emperor.....	341-342	341	342	Childeric LXXXXII.....			
Other.....	342-343	342	343	Childeric LXXXXIII.....			
Proclaimed Emperor.....	343-344	343	344	Childeric LXXXXIV.....			
Other.....	344-345	344	345	Childeric LXXXXV.....			
Proclaimed Emperor.....	345-346	345	346	Childeric LXXXXVI.....			
Other.....	346-347	346	347	Childeric LXXXXVII.....			
Proclaimed Emperor.....	347-348	347	348	Childeric LXXXXVIII.....			
Other.....	348-349	348	349	Childeric LXXXXIX.....			
Proclaimed Emperor.....	349-350	349	350	Childeric LXXXXX.....			
Other.....	350-351	350	351	Childeric LXXXXXI.....			
Proclaimed Emperor.....	351-352	351	352	Childeric LXXXXXII.....			
Other.....	352-353	352	353	Childeric LXXXXXIII.....			
Proclaimed Emperor.....	353-354	353	354	Childeric LXXXXXIV.....			
Other.....	354-355	354	355	Childeric LXXXXXV.....			
Proclaimed Emperor.....	355-356	355	356	Childeric LXXXXXVI.....			
Other.....	356-357	356	357	Childeric LXXXXXVII.....			
Proclaimed Emperor.....	357-358	357	358	Childeric LXXXXXVIII.....			
Other.....	358-359	358	359	Childeric LXXXXXIX.....			
Proclaimed Emperor.....	359-360	359	360	Childeric LXXXXXX.....			
Other.....	360-361	360	361	Childeric LXXXXXXI.....			
Proclaimed Emperor.....	361-362	361	362	Childeric LXXXXXXII.....			
Other.....	362-363	362	363	Childeric LXXXXXXIII.....			
Proclaimed Emperor.....	363-364	363	364	Childeric LXXXXXXIV.....			
Other.....	364-365	364	365	Childeric LXXXXXXV.....			
Proclaimed Emperor.....	365-366	365	366	Childeric LXXXXXXVI.....			
Other.....	366-367	366	367	Childeric LXXXXXXVII.....			
Proclaimed Emperor.....	367-368	367	368	Childeric LXXXXXXVIII.....			
Other.....	368-369	368	369	Childeric LXXXXXXIX.....			
Proclaimed Emperor.....	369-370	369	370	Childeric LXXXXXXX.....			
Other.....	370-371	370	371	Childeric LXXXXXXXI.....			
Proclaimed Emperor.....	371-372	371	372	Childeric LXXXXXXXII.....			
Other.....	372-373	372	373	Childeric LXXXXXXXIII.....			
Proclaimed Emperor.....	373-374	373	374	Childeric LXXXXXXXIV.....			
Other.....	374-375	374	375	Childeric LXXXXXXXV.....			
Proclaimed Emperor.....	375-376	375	376	Childeric LXXXXXXXVI.....			
Other.....	376-377	376	377	Childeric LXXXXXXXVII.....			
Proclaimed Emperor.....	377-378	377	378	Childeric LXXXXXXXVIII.....			
Other.....	378-379	378	379	Childeric LXXXXXXXIX.....			
Proclaimed Emperor.....	379-380	379	380	Childeric LXXXXXXXI.....			
Other.....	380-381	380	381	Childeric LXXXXXXXII.....			
Proclaimed Emperor.....	381-382	381	382	Childeric LXXXXXXXIII.....			
Other.....	382-383	382	383	Childeric LXXXXXXXIV.....			
Proclaimed Emperor.....	383-384	383	384	Childeric LXXXXXXXV.....			
Other.....	384-385	384	385	Childeric LXXXXXXXVI.....			
Proclaimed Emperor.....	385-386	385	386	Childeric LXXXXXXXVII.....			
Other.....	386-387	386	387	Childeric LXXXXXXXVIII.....			
Proclaimed Emperor.....	387-388	387	388	Childeric LXXXXXXXIX.....			
Other.....	388-389	388	389	Childeric LXXXXXXXI.....			
Proclaimed Emperor.....	389-390	389	390	Childeric LXXXXXXXII.....			
Other.....	390-391	390	391	Childeric LXXXXXXXIII.....			
Proclaimed Emperor.....	391-392	391	392	Childeric LXXXXXXXIV.....			
Other.....	392-393	392	393	Childeric LXXXXXXXV.....			
Proclaimed Emperor.....	393-394	393	394	Childeric LXXXXXXXVI.....			
Other.....	394-395	394	395	Childeric LXXXXXXXVII.....			
Proclaimed Emperor.....	395-396	395	396	Childeric LXXXXXXXVIII.....			
Other.....	396-397	396	397	Childeric LXXXXXXXIX.....			
Proclaimed Emperor.....	397-398	397	398	Childeric LXXXXXXXI.....			
Other.....	398-399	398	399	Childeric LXXXXXXXII.....			
Proclaimed Emperor.....	399-400	399	400	Childeric LXXXXXXXIII.....			
Other.....	400-401	400	401	Childeric LXXXXXXXIV.....			
Proclaimed Emperor.....	401-402	401	402	Childeric LXXXXXXXV.....			
Other.....	402-403	402	403	Childeric LXXXXXXXVI.....			
Proclaimed Emperor.....	403-404	403	404	Childeric LXXXXXXXVII.....			
Other.....	404-405	404	405	Childeric LXXXXXXXVIII.....			
Proclaimed Emperor.....	405-406	405	406	Childeric LXXXXXXXIX.....			
Other.....	406-407	406	407	Childeric LXXXXXXXI.....			
Proclaimed Emperor.....	407-408	407	408	Childeric LXXXXXXXII.....			
Other.....	408-409	408	409	Childeric LXXXXXXXIII.....			
Proclaimed Emperor.....	409-410	409	410	Childeric LXXXXXXXIV.....			
Other.....	410-411	410	411	Childeric LXXXXXXXV.....			
Proclaimed Emperor.....	411-412	411	412	Childeric LXXXXXXXVI.....			
Other.....	412-413	412	413	Childeric LXXXXXXXVII.....			
Proclaimed Emperor.....	413-414	413	414	Childeric LXXXXXXXVIII.....			
Other.....	414-415	414	415	Childeric LXXXXXXXIX.....			
Proclaimed Emperor.....	415-416	415	416	Childeric LXXXXXXXI.....			
Other.....	416-417	416	417	Childeric LXXXXXXXII.....			
Proclaimed Emperor.....	417-418	417	418	Childeric LXXXXXXXIII.....			
Other.....	418-419	418	419	Childeric LXXXXXXXIV.....			
Proclaimed Emperor.....	419-420	419	420	Childeric LXXXXXXXV.....			
Other.....	420-421	420	421	Childeric LXXXXXXXVI.....			
Proclaimed Emperor.....	421-422	421	422	Childeric LXXXXXXXVII.....			
Other.....	422-423	422	423	Childeric LXXXXXXXVIII.....			
Proclaimed Emperor.....	423-424	423	424	Childeric LXXXXXXXIX.....			
Other.....	424-425	424	425	Childeric LXXXXXXXI.....			

## RULES OF THE WORLD—Continued

[illegible]

## RULERS OF THE WORLD—Continued

## EMPERORS OF GERMANY—Continued

Name	Lineage, Etc.	Period of Rule	Birth	Death	Name	Lineage, Etc.	Period of Rule	Birth	Death
Adolph	HOUSE OF NASSAU	A.D. 1247-1268	1222	1278	Edward the Confessor	son of Edward I.	A.D. 1041-1066	1016	A.D. 1066
Albert	HOUSE OF AUSTRIA	1298-1308	1250	1308	Harold II	Brother-in-law of Edward	1066	1066	1066
Henry VII	HOUSE OF LUXEMBURG	1308-1313	1282	1313	William I	Obtained the Norman kings	1066-1087	1027	1087
Louis V. or IV	Son of the Count of Flanders	1313-1347	1296	1347	William II	Third son of William I	1087-1100	1066	1100
Charles IV	HOUSE OF LUXEMBURG	1347-1378	1316	1378	Stephen	Third son of Stephen, Count of Blois	1100-1154	1100	1154
Wenceslaus	Son of the Emperor Charles IV	1378-1400	1361	1419	THE PLANTAGENETS		1154-1154	1154	1154
Rupert	HOUSE OF PALATINATE	1400-1410	1392	1410	Henry II	Son of Geoffrey Plantagenet	1154-1159	1133	1189
Segment	1410-1438	1391	1438		Richard I, the Lion-Hearted	Eldest surviving son of Henry II	1159-1169	1157	1189
Albert	HOUSE OF HABSBURG	1438-1440	1414	1486	Henry III	Youngest son of Henry II	1169-1189	1169	1189
Frederick III	Was elected Emperor	1440-1450	1415	1493	Edward I	Eldest son of John	1189-1216	1189	1216
Maximilian I	Son of Frederick I	1450-1519	1459	1551	Edward II	Eldest son of Edward I	1216-1272	1207	1272
Ferdinand I	Younger brother of Charles V	1519-1550	1503	1564	Richard II	Eldest surviving son of Edward I	1272-1295	1284	1295
Maximilian II	Son of Ferdinand I	1550-1576	1527	1576	Richard II	Eldest son of Edward II	1295-1327	1284	1327
Charles V	Youngest son of Maximilian II	1550-1580	1500	1558	Henry VI	Son of Richard II	1327-1377	1312	1377
Maximilian	Son of Charles V	1580-1619	1550	1619	Henry V	Son of John of Gaunt, fourth son of Edward III	1377-1399	1367	1399
Philip II	Eldest son of Charles V	1580-1621	1554	1621	Henry VI	Only son of Henry V	1399-1413	1387	1413
Joseph I	Son of Philip II	1621-1705	1640	1705	Edward IV	His grandfather was Richard, son of Edmund, fifth son of Edward III; and his grandmother, third son of Edward III	1413-1422	1387	1422
Charles VI	Son of Joseph I	1705-1741	1685	1740	Edward IV	Youngest brother of Edward IV	1422-1461	1421	1461
Charles VII	HOUSE OF BAVARIA	1741-1745	1697	1745	Edward V	Son of Edward IV	1461-1483	1441	1483
Francis I	HOUSE OF LOREINE	1745-1765	1706	1765	Richard III	Eldest son of Edward IV	1483-1486	1459	1486
Joseph II	Son of Francis I	1765-1790	1741	1790	Henry VII	Son of Edward IV	1486-1509	1457	1509
Francis II	Son of Joseph II	1790-1806	1765	1806	Henry VIII	Only surviving son of Henry VII	1509-1547	1491	1547
Francis III	Son of Francis II	1806-1815	1782	1815	Edward VI	Son of Henry VIII, by Jane Seymour	1547-1553	1537	1553
THE CONFEDERATION OF THE RHINE		1815-1866			Elizabeth	Daughter of Henry VIII, by Anne Boleyn	1553-1603	1533	1603
THE GERMAN CONFEDERATION		1815-1866			James I	Son of Mary, Queen of Scots, granddaughter of Henry VIII, and Margaret, daughter of Henry VIII	1603-1625	1566	1625
THE NORTH GERMAN CONFEDERATION		1866-1871			Charles I	Only surviving son of James I	1625-1649	1600	1649
THE HOUSE OF HOBENZOLLERN		1871-1896	1797	1888	Commonwealth	Commonwealth declared May 19	1649-1659	1649	1659
William the Victorious	Son of Frederick III and grandson of William I	1888	1859		Commonwealth	Richard Cromwell, Lord Protector	1659-1688	1659	1688

\*Frederick III, son of William I, was emperor from March 9 to June 15, 1888.

## KINGS AND QUEENS OF ENGLAND

Name	Lineage, Etc.	Period of Rule	Birth	Death	Name	Lineage, Etc.	Period of Rule	Birth	Death
Edward I	ANGLO-SAXON KINGS	A.D. 827-837	7127	837	James I	Son of Mary, Queen of Scots, granddaughter of Henry VIII, and Margaret, daughter of Henry VIII	1603-1625	1566	1625
Edward II	First King of all England	837-857	807	857	Charles I	Only surviving son of James I	1625-1649	1600	1649
Edward III	Son of Edward I	857-887	807	887	Commonwealth	Commonwealth declared May 19	1649-1659	1649	1659
Edward IV	Second son of Edward I	887-907	867	907	Commonwealth	Richard Cromwell, Lord Protector	1659-1688	1659	1688
Edward V	Fourth son of Edward I	907-911	887	911	James II	Eldest son of Charles I	1688-1689	1633	1689
Edward VI	Brother of Edward IV	911-925	870	925	William III	Second son of Charles I	1689-1702	1650	1702
Edward VII	Son of Edward VI	925-937	907	937	Mary II	Eldest daughter of James II	1702-1714	1665	1714
Edward VIII	Brother of Edward VI	937-957	911	957	George I	Son of Elizabeth of Hanover, by Sophia, daughter of James II	1714-1727	1660	1727
Edward IX	Son of Edward VII	957-977	937	977	George II	Only son of George I	1727-1760	1683	1760
Edward X	Son of Edward VIII	977-997	957	997	George III	Grandson of George II	1760-1820	1725	1820
Edward XI	Son of Edward IX	997-1017	977	1017	William IV	Third son of George III	1820-1837	1765	1837
Edward XII	By request and election	1017-1037	997	1037	Victoria	Daughter of Edward IV, fourth son of George III	1837-1901	1819	1901
Edward XIII	Another son of Edward	1037-1047	1017	1047	George V	Son of Edward VII	1901-1910	1861	1910
Edward XIV	Another son of Edward	1047-1048	1017	1048	George V	Son of Edward VII	1910-1936	1861	1936

**Russia.**—The monarchy is usually regarded as having been founded by Rurik, about A. D. 862, his dominions, and those of his immediate successors, including Novgorod, Kiev, and the surrounding country. In 980-1015 Vladimir introduced Christianity, and founded several cities and schools. From this period down to 1240, when the country was overrun by the Tartars, Russia, with few exceptions, was the theater of civil war. In 1328 the seat of government was transferred to Moscow, and in 1481 the Tartars were finally expelled.

**The Romanoffs.**—In 1613 the house of Romanoff, whence his present majesty is descended, began to reign, and in 1649, when this period the empire acquired strength and consistency. Under Alexis Mikhailovitch (1645-76), White Russia and Little Russia were conquered, the Aukra, and the Cossacks of the Ukraine acknowledged the supremacy of the czar, various internal improvements were effected, and the power of Russia began to be felt and feared by all her neighbors.

**Under Peter the Great.**—At length, in 1696, Peter the Great ascended the throne, and the destinies of Russia and of the northern world were immediately placed in his hands. He became sole ruler in 1699, and occupied the throne till his death in 1725. He completed the conquest of Siberia, waged successful wars with Charles XII. of Sweden, and by the treaty of Nystat in 1721 obtained Esthonia, Livonia, Ingermannland, and part of Finland, thus gaining a large maritime territory on the Baltic. He founded St. Petersburg in 1703, and made it the capital in place of Moscow.

**The Eighteenth century** in Russian history is a century of oppression. Peter the Great was succeeded by his wife, Catherine II. (1762-7). A grandson of Peter the Great, Peter II., followed Catherine, reigning from 1772 to 1796. The next sovereign was Anna (1796-97), whose reign was a period of German influence. Ivan VI. (1740-1) was soon displaced by the anti-German party, and Elizabeth (1741-62), daughter of Peter the Great, ascended the throne. Elizabeth's reign was obtained by the treaty of Abo, and Russia took part against Prussia in the Seven Years' war. The first Russian university, that of Moscow, was founded in 1755.

The death of Elizabeth and the accession of Peter III. in January, 1762, greatly relieved the hard-pressed Frederick the Great, because Peter at once reversed the Russian policy. In July, 1762, he was deposed and murdered by his wife, Catherine II. (1762-96), whose reign is of great importance in the progress of Russian power. She added to the empire by the three partitions of Poland (1772, 1793, 1795), in which she had the principal share. The treaty of Küchuk-Kainarji, which concluded a war with Turkey in 1774, freed the Crimea from the suzerainty of the porte, and prepared the way for its annexation by Russia in 1783. The Crimean came under Russian protection in 1783, and Courland was incorporated in 1795.

**Napoleonic Period.**—In the Napoleonic period Russia took an important part. In the general history of Europe, Catherine II. and her successor, Paul I. (1796-1801), joined the second coalition against Napoleon, and a Russian army operated with some success in Italy and Switzerland, and the emperor formed an alliance with Napoleon. He was murdered in 1801, and his son, Alexander I. (1801-25), succeeded to the throne.

Alexander joined the alliance with Napoleon, but the battle of Austerlitz (1805) ended that alliance. He was then associated with Prussia, but the victories of Jena and Friedland, in 1806, broke the alliance. The bloody battle of Eylau (1807) was drawn, but at Friedland, in the same year, Russia was heavily defeated. Alexander then concluded the treaty of Tilsit with Napoleon, and supported the measures directed against British commerce. But the French alliance gradually became irksome to Russia. Ultimately Alexander repudiated Napoleon, and to punish him Napoleon made his disastrous march to Moscow in 1812.

The Russians cooperated in the later operations against France, and by the treaty of Vienna (1815) Poland was given to Russia.

By the treaty of Frederikshavn (1809) Finland was ceded by Sweden to Russia, but it kept its own constitution. Georgia was a subordinate kingdom. On the other hand, a war with Turkey, ended by the treaty of Bucharest (1812), gained Bessarabia for Russia; and the treaty of Tilsit (1813) deeded Persia of some territory in the Caucasus.

**The Alexanders.**—Alexander began his reign with liberal measures, but latterly he became more and more reactionary and despotic. He was the prime mover in the Holy Alliance of 1815, which aimed at the complete suppression of liberalism in every form. By his earlier liberal policy, however, he sowed the seeds of the revolutionary and constitutionalist movement.

The reign of his brother, Nicholas I. (1825-55), was, throughout, one of thorough reaction. Poland revolted in 1830, and was deprived of its constitution. The popular uprisings in Europe during 1848 alarmed Nicholas, who sent an army to the assistance of Austria against the revolution in 1849. On the other hand, he cooperated with Britain and France at Navarino (1827), and by making war on Turkey (1829-30) assisted in freeing Greece from the grasp of the empire. In 1829 gave Russia an accession of territory at the expense of Turkey, and in 1828 Erivan was conquered from Persia. Further designs on Persia and on the Crimea were abandoned (which see), but it was not concluded till after the accession of Alexander II. The treaty of Paris (1856) neutralized the Black Sea, and Bessarabia was returned to Rumania.

**Important Reforms.**—The reign of Alexander II. (1855-81) is one of the most important in Russian history. Russia's failure in the Crimean war caused her rulers to turn their eyes to home affairs, and to inaugurate a period of reform. The millions of serfs in the empire were liberated by the famous emancipation decree of 1861. The judicial system was reorganized, and the jury trial was introduced. A law of 1864 created provincial and district councils, known as *zemstvos*, in thirty-four governorates. Russia, Russian Rumania, and the representative bodies, called *dumas*, were established in many towns in 1870.

An insurrection in Poland in 1863 led to the withdrawal of its separate government, and in 1868 Poland was completely incorporated with Russia. Compulsory military service became the law in 1874. The government of the Baltic provinces was incorporated with that of Russia in 1876. The reforming energy of the government was exhausted by about 1860, and fear of its own work caused it to adopt a reactionary policy.

**Rise of Nihilism.**—From this time nihilism becomes a notable force in Russian politics, and its increasing strength led Alexander to make Leve-Melkoff practically dictator in 1881. Melkoff recommended a policy of moderate reform, and Alexander was about to issue a decree calling an assembly of notables when he was assassinated in St. Petersburg in March, 1881.

Alexander's reign witnessed a great advance of the empire in Central Asia and the Far East. Khiva and Bokhara were made states; Khokand, Tashkent, and Samarkand were conquered; and China ceded to Russia her present Amur and coast provinces on the Pacific and the northern half of the United States. In 1867, in the three great Prussian wars of his reign Alexander maintained strict neutrality, but without concealing his friendliness to Prussia. He refused to give aid to the French and to free himself from the Black Sea clauses of the treaty of Paris (1856).

**War with Turkey.**—The Russo-Turkish war of 1877-78 was partly the outcome of Pan-Slavism. It led to the treaty of Berlin (1878), under which Russia recovered Bessarabia.

Alexander II. was succeeded by his son, Alexander III. (1881-94), who soon reversed his father's liberal policy. Press freedom disappeared, and the kindred of the Romanoffs were again suppressed. The powers of the *zemstvos* were severely restricted in 1890, and the direct representation of the peasants on towns was abolished. The *dumas* were deprived of all real independence in 1892. Alexander II.'s judicial reforms were partly undone, and the village communities, known as *obshchinas*, were brought under the ministerial control of the land-owners. Russification was vigorously pursued in Poland and the Baltic provinces, and in 1890 the first steps toward the Russification of Finland were taken.

Alexander III. was not friendly to Germany, but avoided hostilities more serious than those of a tariff war, although the Bulgarian crisis of 1885 subjected their relations to a severe strain. Russia and France now began to draw close together, but a Franco-Russian alliance was not officially admitted till 1896-7, and its terms are still secret. Mary was annexed in 1884, and the occupation of Penjdeh in 1885 nearly led to war with Britain. Alexander III. escaped the German railway strike of 1896, and died of disease in November, 1894.

**The Far East.**—After the reign of Alexander III. comes the fateful reign of his son, Nicholas II. In 1896 China granted permission to occupy the Siberian railway (1899) through Manchuria to the far eastern Russian seaport Vladivostok. In December, 1897, in consequence of the Germans having extorted Kiauchow from China, the Russian fleet, under Port Arthur, and in the following year the obtained from China a lease of it and some neighboring territory, although in 1895 she had taken the chief part in preventing Japan from taking it. The price of victory was shared in the international expedition to China in 1900, and herself suppressed risings in Manchuria with the utmost energy. Professed to be ready to make even an evacuation of Manchuria as soon as possible, she was preparing for virtual annexation; but her aggressive action in Korea aroused Japanese opposition, and led to the war of 1904-5.

By the treaty of Portsmouth (1905), which ended this war, Russia lost—for the time being at least—all influence in Manchuria, Korea, and China, and had to cede to Japan Port Arthur and its territory, and also southern Sakhalin.

**The Czar's Peace Proposal.**—In 1898 the czar sent a proposal to all the powers suggesting a conference on armaments, and the result was the notable peace conference at the Hague in 1899. The machinery created by this conference proved sufficient to settle peacefully the serious dispute with Spain which arose out of firing of Russian warships on British fishing vessels at the Dogger Bank in October, 1904.

Nicholas II.'s internal policy has been, on the whole, reactionary, especially in regard to Finland, whose free institutions were one by one destroyed, until in December, 1903, she was deprived of the last remains of her government. Bobrikov, the governor who carried out this work, was assassinated in June, 1904; and in the following month De Helve, minister of the interior, the principal agent of the reaction, also fell a victim to assassination. He was succeeded by the liberal-minded Prince Sviatopolk-Mirsky, and for a time the czar seemed inclined to reform.

**Recent Reforms.**—Representatives of the *zemstvos* met in November at the invitation of the czar, and formulated a program of reforms. Similar meetings were held by gatherings of professional men, and by working-class organizations. A great strike occurred in St. Petersburg in January, 1905, and the strikers, led by priest named Gapon, were shot by the army on Sunday, January 22, 1905, to present an address to the czar at the winter palace. The czar had fled to Tsarskoe Selo, and the strikers were warned to discontinue their mercy. This was followed by a period of disorder approaching chaos throughout European Russia.

**The Imperial Duma.**—In August, 1905, the czar issued a manifesto ordering the election of an imperial representative *duma*; in Sep-

tember, Caucasasia, and especially Baku, was the scene of terrible disorders, during which the oil industry suffered severely. Near the end of October a general strike was declared the autonomy almost powerless, and on October 30 the czar was compelled to promise complete liberty and self-government. Count Witte was made president of a reorganised council of ministers, with instructions to form a reformist cabinet. The general strike in Finland compelled the czar to restore Finland a constitution and liberties. The bureaucrats have attempted to discredit the movement by instigating attacks on Jews, and other outrages, especially in Odessa, where the authorities have permitted appalling atrocities.

The imperial duma, promised in 1905, was duly elected early in 1906, and held its first meeting on May 10 at St. Petersburg. It was dissolved later in the year because too liberal, and a second one, elected in 1907, met the same fate. By various devices the government managed to get a less advanced duma elected late in 1907, which did some useful work in 1908. An important Anglo-Russian convention was signed in 1907.

**References.**—Wallace's *Russia*; Leroy-Beaulieu's *The Empire of the Tsar*; Norman's *A History of Russia*; Brockhaus's *Encyclopædia Britannica*; in Russian; Drage's *Russian Affairs*; Burstein's *Ad. Russen*; the *History of Russia*, etc.; Stepiak's *King Lear and King Lear*; Kropotkin's *Memories of a Revolutionary*; Morfill's *Russia*; Villan's *Russia*; the *History of Russia*; *Perris's Russia in Revolution*; Wellesley's *The War in Russia in Peace and War*; Gans's *The Downfall of Russia*; *Nikolayev's*; *The Crisis*; *Mexican's Russia*, *Travels and Studies*.

**Salvador** is the smallest but most densely-peopled republic of Central America. It was originally called Cuscatlan, and was conquered by Alvarado in 1525-6. In the first half of the sixteenth century it was a province of the Spanish colony of Guatemala, but shared in the liberation from Spanish rule, which followed the Mexican uprising of 1821. It was for a short time included in the empire of Iturbide, after which it was a state in the Central American federation until the latter's dissolution in 1839.

Its present constitution was proclaimed in 1824, under the federation, and subsequently modified in 1836. The country is rich in gold and silver, and has a large foreign debt amounting, in 1911, to more than \$5,000,000.

**References.**—Squier's *The States of Central America*, and *Salvador*, Bureau of American Republics Bulletin 58.

**Scotland.**—When the Romans extended their conquests (54 A. D.) to the Forth and Clyde, the country beyond, known to them as Caledonia, was occupied by the Picts, a Celtic people (perhaps partly by Celticised Iberians) speaking Gaelic, who called their country Alban or Albion; while the south of what is now Scotland was possessed, like south Britain, by Cymric Celts, speaking a kind of Welsh. In the fifth century the Scots came from their home in Ireland into Argyllshire, and after centuries of war with the Picts, put the crown of Scots and Picts on the head of their king, Kenneth, in 843. The Scots, partially Christianised when they came to Scotland, as their great missionary, and by means of him and his followers converted the Picts, the Cymri, and the northern tribes of the English, who since the fifth century had established themselves in the eastern parts of Britain as far north as the Forth.

In the tenth century the country of the Picts and Scots came to be known by the name of Scotia (still then the name of Ireland), Nova Scotia, or Scotland; and it soon came to include all of what is now called Scotland, and for a time even Cumberland and Westmorland; Cymric Northeyde became permanently Scottish in the tenth century; and in the same century and the beginning of the next, Lothian, the Merse, and Teviotdale, all heretofore parts of the country of the English as any part of England, and more Anglian, perhaps, than any part of the south, were bestowed on the Scottish kings.

The reign of Malcolm Canmore (1057-93) was a period of social, political, and religious revolution. Malcolm, long an exile in England, married Margaret, the sister of Edgar Atheling. Malcolm and his saintly queen

(afterward canonised) encouraged the introduction of English customs and civilisation, the English language and English soldiers; and began the process which led to the conversion of the Scottish Church to Roman usages. English (Anglo-Saxon) settlers established themselves in large numbers outside of the already purely English region in the south-east, which more and more became the headquarters of the kingdom; and the Anglo-Saxons were soon followed by many Normans, bringing with them the influence of French culture.

David (1124-53) greatly promoted the well-being of church and state; and Scotland was a prosperous country till the death of Alexander III. (1286). Then the attempts of Edward I. of England to get Scotland incorporated by hook or crook with the rest of south Britain, led to the long, bloody, and destructive wars of independence, was disastrous to all save national spirit and energy; and for 400 years Scotland, though free, was poor, barbarous, and torn by dissension.

The Celtic element ventured, under the later kings, to the conclusion that, with the Saxon overlords at Bute in 1411, but were signally worsted. Bannockburn (1314) encouraged the nation to resist to the uttermost the superior might of England; and the adoption of the Reformation (Scotland adopted heartily the Presbyterian polity) were the crowns of England and Scotland united in the person of James VI. (1603). The Scots, enraged by the attempts of Charles I. to impose the Anglican ritual, fought stoutly with the English parliament against the king, but enthusiastically supported the Restoration.

Under Charles II. and James II. the national church was depressed, and the covenanteders persecuted; and the revolution was welcomed (1688) by the great bulk of the nation. The crown has been confirmed by the personal tie of the sovereign in 1603; the kingdoms were united by legislative union in 1707 (the Scottish church and the covenanteders maintaining, in spite of a good deal of Scottish discontent, and it was mainly the highlanders who, in 1715 and 1745, rose in defense of the claims of the ancient line of the exiled James II., under the old name of the young pretender). From Scotch history of Scotland may be regarded as merging in that of Great Britain.

**Serbia.**—Serbia was anciently inhabited by Thracian tribes; subsequently it formed part of the Roman province of Moesia. It was afterward occupied in succession by Huns, Ostrogoths, Lombards, Avars, and other tribes. The Servians entered it in the seventh century, and were converted to Christianity in the next century. They acknowledged the supremacy of the Byzantine emperors, but later made themselves independent, and under Stephen Dushan (1350-60) the kingdom of Serbia included all Macedonia, Albania, Thessaly, northern Greece and Bulgaria.

About 1374 a new dynasty ascended the throne in the person of Lazar, who was captured by the Turks at the battle of Kosovo (in Serbia) in 1389, and put to death. Serbia now became tributary to Turkey. At the end of the fifteenth century it became a Turkish province, and so remained for nearly 200 years. By the peace of Passarowitz, in 1718, Austria received the greater part of Serbia, with the capital, Belgrade. But by the peace of Belgrade, in 1739, this territory was transferred to Turkey. The barbarity of the Turks led to several insurrections.

At the nineteenth century Cerni-George placed himself at the head of the malcontents, and, aided by Russia, succeeded after eight years of fighting in securing the independence of his country by the treaty of Bucharest, 1812. The war was renewed in 1813, and the Turks prevailed. In 1815 all Serbia rose in arms under Milosh, and, after a successful war, obtained complete self-government. Milosh became the hereditary prince of the land. Milosh was compelled to abdicate in 1839, and was nominally succeeded by his son Miskin, who died imme-

diately, leaving the throne to his brother Michael. In 1842 this prince was compelled to follow the example of his father and quit the country.

Alexander Kara-Georgevitch, son of Csaery George, was elected in his stead; but in December, 1858, he also was forced to abdicate. Milosh was then recalled, but survived his restoration a little more than a year, and his son Michael succeeded him (1860), but was assassinated by the partisans of Prince Alexander July 10, 1868. The princely dynasty was then conferred on Milan (Obrenovitch), grand-prince of Serbia.

After the fall of Pieva, in the Russo-Turkish war of 1877-8, Serbia took up arms against Turkey, and by the treaty of Berlin (July 13, 1878) it obtained an accession of territory and the full recognition of its independence. It was erected into a kingdom in 1882. In 1885 a short war took place between Serbia and Bulgaria, resulting in favor of the latter. In 1889 Milan abdicated in favor of his son Alexander I. He and his queen were assassinated in 1903 and Prince Georgevitch succeeded.

**References.**—*History of Serbia*; *The Serbian People*; Miller's *The Balkans*; *Mijatovitch's Serbia*; *History of Serbia*.

**Siam** appears to have no place in history prior to A. D. 638, and the credible records go back only to 1350, the date of the foundation of Ayutthia, the old capital. The Portuguese established intercourse with Siam in 1511, but in the seventeenth century were gradually supplanted by the Dutch. English traders were in Siam very early in the seventeenth century, and the consequent massacre their factory at Ayutthia was abandoned in 1688. The French were expelled about the same time, and the trade was neglected until 1856, when Sir John Bowring's treaty again opened up Siam to European trade. Since that date western ideas of civilisation have been introduced to some extent, and a few of the younger youth are now sent to Europe for their education.

The present king is Chulalongkorn I., who was born in 1853, and succeeded his father in 1868. Like his father, he has had an English education, and speaks English. Recently considerable portions of Siamese territory next Cambodia and partly on the west of the Mekong have been acquired by France, and the French influence in Siam is a great area in eastern Siam is also recognised as under French influence, and, in 1909, Great Britain obtained important rights in a number of Malay states.

**References.**—Hunt's *Old Siam*; *Around Tonkin and Siam*; Smith's *Journeys on the Upper Mekong and Five Years in Siam*; Young's *The Kingdom of Siam*; Baker, McCarthy's *Exploring and Exploring in Siam*; Campbell's *Siam in the Twentieth Century*; Thompson's *Lessons*.

**Spain** was first known to the Phenicians, subsequently to the Carthaginians, and, in the third century before the birth of Christ, to the Romans. It was completely subdued under Augustus, after which it enjoyed tranquillity for nearly 400 years. This state of peace was disturbed by the irruption of the northern barbarians—the Suevi, the Vandals, and the Alans. Christianity was introduced about the end of the sixth century, the invasion of the Moors took place in the beginning of the eighth, and they overran the whole country in 711. The Moors were finally expelled in the year 1492.

Under Charles V., Spain made a great figure in the general affairs of Europe. He reigned forty years, and, in 1556, abdicated in favor of his son, Philip II. In 1598, he was bequeathed to his successor, Philip III., Belgium, Naples, Sicily, and Portugal. Charles II., the last prince of the Austrian branch, reigned from 1686 to 1700; after which began the well-known war for the succession of the Spanish dominions, in which the claim of Austria was supported by the great powers of Europe, and, notwithstanding the opposition of the allies, however, the grandson of Louis XIV. reigned in Spain, relinquishing the Belgic provinces to the house of Austria.

The first king of the French line, had a long and turbulent reign. After him Ferdinand VI., a prudent prince, introduced various reforms, and maintained peace; but,

he dying in 1759, his son, Charles III., went to war with Great Britain. Peace ensued in 1763, and continued till 1778, when Spain, after a neutral in the American war, declared independence, was prevailed on to take up arms against England, and obtained, at the peace of 1783, the Florida and Minorca.

Charles IV. succeeded to the crown in 1788, and became soon after a party to the coalition against republican France, which then declared war, and invaded Spain, but, after France, the first of the great powers, to conclude a treaty of peace in 1795. In little more than a year after this, the cabinet of Spain joined its late opponent, and declared war against Britain. The abdication of the royal family of Spain took place at Bayona in May, 1808. It was followed by the general resistance of the inhabitants to the invasion of their country by Napoleon I., and by the subsequent expulsion of the French by the troops of Great Britain combined with those of Portugal and Spain.

The dissatisfaction and indignation excited by the tyrannical proceedings of Ferdinand VII. in the beginning of 1808, of great importance, by which the constitution of the cortes, as established in 1812, was restored, and such salutary reforms established, as the crown, and the crown as seemed best calculated for securing the rights of the people.

In 1823 Spain was again invaded by French troops, under the Duc d'Angoulême, whose object was to put down the new government, and to restore Ferdinand to absolute power. They penetrated the country without resistance; and, having laid siege to Cadix, the king was given up to them, and afterward the town. In 1833, on the death of Ferdinand VII., the queen-mother, Christina, was appointed queen-regent during the minority of her son, Isabella II., to whom, by his will, he bequeathed his throne. On this, Don Carlos, the late king's brother, laid claim to the crown, when a civil war, which lasted till 1840, ensued. In 1840, the partisans of Don Carlos were finally defeated.

The next event of importance was the contest between Ferdinand VII. and his queen-dowager Christina, for the supreme power during the minority of the queen. Espartero was successful from 1840 to 1843, but was compelled to flee before Don Carlos and Narvaez, and was not restored till 1847. Espartero's success had obliged Christina to retire to France, whence she returned after his fall, Narvaez and the moderados having control of the government. Isabella was now declared of age, married her cousin, Francis of Assisi, and succeeded to the throne as Isabella II.

During her reign Spanish history presented a dismal picture of faction and intrigue, the queen leading a dissolute life, and the liberals and conservatives successively gaining control of the government. The disputes finally ended in a successful revolt of the liberals, the queen being obliged to fly to France, and the throne being offered in 1870 to Amadeus, a son of Victor Emmanuel. Finding his task too difficult, he resigned in 1873.

A republic was now formed, with Castelar as leading spirit, but it was soon brought to an end, and the throne was offered, in 1874, to Alfonso, the young son of the exiled Queen Isabella. The death of Alfonso XII., at the age of twenty-eight, in 1885, threw upon his widow, Maria Christina of Austria, the burden of the regency (till 1902) for her then unborn son, Alfonso XIII., the present king (1902-1909). During his reign the material progress of the nation was considerable, and the financial condition became more hopeful.

Owing to the bad faith of the conservative party (1879), the promise made by Martines Campos of reforms in Cuba was broken, and the secession of the colony became inevitable. All that was left of the old Spanish empire of the west was lost in the consequent war with the United States in 1898, and Spain was free of what for years had been a burden to her.

In May, 1906, King Alfonso married Prin-

cess Victoria Eugenie, daughter of Prince Henry of Battenberg, the youngest sister of the late King Edward VII. The life of the king has been attended several times, and at the beginning of 1911 the spirit of popular government threatened to overturn the monarchy.

*References.*—Burke's *History of Spain*; Hume's *Spain*, its *Greatness and Decay*, and *History of Modern Spain*; Walf's *Spain*; *Story of the Nations*; Chatelet's *The Moors in Spain*; *Story of the Nations*; Meyrick's *The Church in Spain*; Seymour's *Scandinavia* in *Spain*.

**Sweden.**—The history of Sweden before the union of Calmar in 1397 is rather obscure in its earlier part and rather confused throughout. Christianity was introduced by German missionaries in the ninth century, and the first Christian king, Olof Skötkonung, succeeded the throne about 1001, but for some time after there was a keen conflict between the Christian and the pagan parties.

One of the most notable men of this early time was Birger Jarl, a sort of mayor of the palace under Eric the Stammerer (1222-50), who gained so strong a position that he was able to have his son Valdemar seated on the throne in 1250. Valdemar was dethroned by his brother, Magnus Ladulås (1275-90), a vigorous ruler and wise lawgiver. Sweden and Norway came under the same monarch in the person of Magnus Småck, a nephew of Birger, in 1319, and with him began the series of events which led to the union of the Scandinavian kingdoms under the crown of Denmark and her nephew Eric of Pomerania (Eric XIII.) in 1397.

Margaret died in 1412, and thereafter Eric XIII. ruled alone; but his incompetence and oppression drove the Swedes to revolt under Engelbrecht Engelbrechtsson, and in 1436 he was compelled to appoint Charles Canutus, as regent in Sweden. In 1448 Charles of Oldenburg became king of Denmark and Norway, but the Swedes proclaimed Charles Canutus king; and after banishments and recalls he died king of Sweden in 1470. Sture, a nephew of Canutus, was appointed administrator in 1471, and King Christian was defeated in an attempt to enforce his claims. Charles VIII. succeeded in 1494, assisted by his son Hans, who invaded Sweden and established his authority in 1497. Sture was, however, recalled by the Swedes in 1500, and after his death, in 1523, Christian II. succeeded his father Hans in 1513, and thence invaded Sweden. Sten Sture the Younger was defeated and mortally wounded, and Christian was crowned at Stockholm in 1520. He signalled his coronation by wholesale executions, notably the Blood Bath of Stockholm, and in consequence a rebellion took place in 1521 under Gustavus Vasa, who in 1523 was proclaimed independent king of Sweden.

Gustavus Vasa, whose reign extended from 1523 to 1560, introduced the Lutheran religion as that of the state, and in 1544 he made the monarchy hereditary. He was succeeded by his eldest son, Eric XIV., a cruel and fanatical man, who was dethroned in 1569 by his brother John. John ascended the throne as John III., and caused Eric to be poisoned in 1577. He concluded the peace of Stettin, by which the separation of Sweden from Denmark and Norway was definitely ratified. John's son, Sigismund, who came to the throne in 1592, was brought up in the Catholic faith in Poland, but he refused to maintain the Catholic faith in Sweden. He did not keep his promise, and was deposed in 1599, Duke Charles of Södermanland, youngest son of Gustavus Vasa, being proclaimed regent.

In 1604 the regent was proclaimed king as Charles IX. On his death, in 1611, his son Gustavus II. (Gustavus Adolphus) ascended the throne. His famous military and political policy, his famous wars, and his negotiations the conclusion of wars begun by his father against Denmark and Russia, and played a great part in Germany in the Thirty Years' war. He met his death at the battle

of Lützen, in 1632, and was succeeded by his daughter Christina.

The peace of Westphalia, which ended the Thirty Years' war, in 1648, added to Sweden Bremen, Verden, and Alsace, parts of Pomerania, while Sweden already possessed, on the Russian side of the Baltic, Livonia, Esthonia, and other territories. Christina, who had left the real work of government to Axel Oxenstierna, abdicated in 1654, leaving as her successor Charles X., son of the sister of Gustavus Adolphus. Charles' short reign (1654-60) was a shadowy one, marked by wars with Poland and Denmark. Charles XI., son of his predecessor, came to the throne at the age of four.

The country was then long under a council of regency, but Charles assumed the government in 1672. He reorganized the army, adopting a regular system of conscription, and restored the finances. He died in 1697, and was succeeded by his son, the celebrated Charles XII. His career of conquest ended in the disastrous battle of Poltava, July 8, 1709, and he was killed at the siege of Frederickshald, Nov. 30, 1717, where he pushed the conquest of Norway. He was succeeded by his sister, Ulrica Eleonora, who in 1720 resigned the government to her husband, Frederick I., crowned prince of Holstein-Gottorp. The absolute authority which the crown had enjoyed under Charles XI. and Charles XII. was checked by the power of the nobles, and Sweden now lost most of her great eastern provinces, Ingria, Esthonia, Ingermanland, part of Finland, etc.

The struggles of the Hats and Caps, the former a war party, and the latter in favor of peace, began at the death of Frederick I. In 1751, Adolphus Frederick of Holstein-Gottorp was elected king. During his reign the country was distracted by the rivalries of the Hats and Caps, and the royal power sank into abeyance. Charles XIII. died in 1771, and was succeeded by his son Gustavus III., whose reign was distinguished by a monarchical revolution. He was assassinated at Stockholm by Count Arfvelson in 1792. His son Gustavus IV. was deposed, and his family declared forever incapable of succeeding to the crown, in 1809. His uncle, the duke of Södermanland, ascended the throne with the title of Charles XIII. Finland was finally ceded to Russia in 1809.

In 1810 the states elected Jean Baptiste Bernadotte crown prince. In the final struggle with Napoleon previous to 1814 Sweden joined the allies, while Denmark took the part of France. By the treaty of Kiel (1814) Sweden ceded to Denmark her last German possessions in Pomerania, while Denmark was compelled to cede Norway to Sweden. Norway resisted the cession, and accepted Charles as king only when he had agreed to their free constitution as a separate state. Bernadotte succeeded to the crown in 1818, under the title of Charles XIV. He died in 1844, and was succeeded by his son Oscar I., whose reign was singularly peaceful and uneventful. He died in 1859, and was succeeded by his son Charles Louis Eugene, under the title of Charles XV., whose reign was marked by constitutional reforms. Charles XV. died in 1872, and was succeeded by his brother Oscar II., a wise and prudent ruler. In 1905 the union between Norway and Sweden was dissolved by mutual agreement after negotiation and after the Norwegian legislature had decreed its dissolution. Oscar II. died in December, 1907, and was succeeded by his son Gustavus V., who reconstructed the imperial ministry in 1909.

*References.*—Montelius' *Civilization of Sweden*; *Arvid Thomsen's History of Sweden*; *and the Swedes*; Baker's *Picture of Swedish Life*; *Baltic Scandinavia*; Kennedy's *Thirty Seasons in Scandinavia*.

**Switzerland.**—The origin of the inhabitants of Switzerland were the Celtic Helvetii, and the Rhetii, of doubtful affinity; both were conquered by Julius Cæsar and the generals of Augustus, and Romanized. Overrun by the Burgundians in the west, and their Germanic kinsmen, the Alemanni on the north, Helvetia became subject to the Frankish kings and was Christianized in the seventh century. Most of the territory was subject to the part of the Holy Roman empire; and in



1273 a Swiss noble, Rudolf of Hapsburg in Aargau, became German emperor.

Soon after Rudolf's death (in 1291) the inhabitants of Uri, Schwyz, and Unterwalden formed a league to defend their common interests, and in 1315 crushed an Austrian army at Morgarten. In 1332 Lucerne joined the alliance, and in 1353, Bern, Zurich, Glarus, and Zug. The Austrians were again routed at Sempach in 1386, and in 1388 at Näfels. The Swiss next had a fierce but triumphant struggle with Charles the Bold of Burgundy, whom they routed at Grandson and Morat in 1476, and finally at Nancy (where Charles was slain) in 1477.

When the reformation began there were

thirteen cantons, and the cantons took opposite sides from the beginning, not without serious turmoil and bloodshed. The treaty of Westphalia in 1648 recognised Switzerland as an independent state. Some of the cantons were strictly aristocratic and some highly democratic, and there was much discontent long before the French revolution, when, in 1798, between civil strife and French armies, the old republic (or rather alliance) came to an end.

The Helvetic republic of nineteen cantons, under French auspices, endured till 1805; then a new republican constitution was adopted, the Federal Pact of twenty-two cantons. On Napoleon's downfall Valais,

Neuchâtel, and Geneva, which had been incorporated with France, were restored, and Swiss neutrality and inviolability were recognised by the treaty of Vienna in 1815. Religious troubles led to a Catholic league in 1844, which was suppressed by the Federal forces in 1847. The present constitution was adopted in 1848, but revised in 1874. The most important recent event was the purchase of the railway lines by the state in 1898.

**References.**—McCracken's *Rise of the Swiss Republic*; Visschers' *Geneva and Switzerland*; Adams and Cunningham's *The Swiss Confederation*; Dawson's *Social Switzerland*; Collingridge's *The Alps in Nature and History*.

### HISTORIC TREATIES AND ALLIANCES

NAME OF TREATY	DATE	CHARACTER OF RESULT	NAME OF TREATY	DATE	CHARACTER OF RESULT
Adrianople	1829	Adrianople restored to Turkey by the Russians.	Munster	1648	Between France and the Emperor of Sweden. By this peace, the principle of a balance of power in Europe was first recognised.
Aix-la-Chapelle	1748	Between Great Britain, France, Holland, Hungary, Spain, and Genoa. A number of previous treaties renewed and confirmed.	Nankin	1842	Between the empire war between Great Britain and China.
	1818	Between the Allies and France. The latter pays 205,000,000 francs to the Allies.	Nantes, Edict of	1598	Henry IV. of France granted toleration to the Huguenots.
Amlens	1802	Treaty of peace between Great Britain and Holland, France, and Spain.	Nystadt	1721	Closed the war between Sweden and Russia.
Augsburg, League of	1686	Between Holland and other European powers to enforce respect for the treaties of Munster and Nimeguen.	Paris, Treaties of	1763	Terminated the Seven Years' war in America, and the French and Indian war.
Baden	1714	Terminating the war of the Spanish succession between France and the emperor.		1783	Terminated the American Revolutionary war.
Bast	1795	Between France and Prussia and between France and Spain.		1814	Settled the war between France and the Coalition.
Berlin decree	1806	Issued by Napoleon against the commerce of England.		1856	Terminated the Crimean war.
Breda	1667	Treaty between England, Holland, France, and Denmark.		1898	Terminated the Spanish-American war.
Breslau	1742	Between Maria Theresa of Austria and Frederick II. of Prussia.	Partition of Poland	1772	Secret treaty between Russia and Prussia at St. Petersburg.
Bretigny	1360	Treaty of peace that interrupted the Hundred Years' war between England and France.	Pasau	1755	Between Russia, Austria, and Prussia.
Calmar, Union of	1397	United Denmark, Sweden, and Norway under Queen Margaret of Denmark.	Perry's treaty	1854	Commercial treaty between United States and Japan.
Cambray	1608	League against Venice, comprising the pope, the emperor, and the kings of France and Spain.	Portsmouth	1805	Treaty between Japan and Russia.
Cambray, Peace of	1529	Between France and Charles V.	Prague	1866	Peace between Prussia and Austria.
Campo Formio, Peace of	1797	Between France and Austria.	Presburg	1805	Between France and Austria; ancient states of Venice ceded to Italy.
Carlowitz, Peace of	1699	Between Turkey and Austria, Poland and Venice. Humiliating concessions made by Austria.			Independence of Switzerland stipulated.
Carlsbad, Congress of	1819	Held by the German powers to protest against the progress of free institutions and popular rights.	Pratona	1902	Terminated the Boer war between Great Britain and Transvaal.
Coalitions against France	1792-1813	Led by England for the purpose of breaking down the French influence in Europe.	Pyrenees	1659	Between France and Spain; mutual concessions of territory made.
Concordat	1801	Between Napoleon I. and Pius VII., whereby the former was made in effect head of the Gallican church.	Quadruple Alliance	1718	Between Great Britain, France, the emperor, and Holland, for the purpose of guaranteeing the succession of the reigning families in Great Britain and France, and settling the partition of the Spanish monarchy.
Constance	1183	Between Frederick Barbarossa and the Lombard cities.	Rastadt	1714	Between France and Austria.
Copenhagen	1660	Between Denmark and Sweden.	Rastadt, Congress of	1797	Between France and the empire, established a general peace with the Germanic powers.
Fontainebleau	1807	Between Napoleon and the royal family of Spain.	Reichenbach	1806	Secession of the Germanic princes from the empire, to the cause of Napoleon, forming the Confederation of the Rhine.
Frankfurt	1871	Conclusion of the preliminary treaty of Versailles.	Ryswick	1697	Between France and the allied powers, closing the war of the "Patch Note."
Gastein, Convention of	1865	Between Prussia and Austria.	St. Clair-Sur-Epte	911	Terminated the war between the Norse and the Franks and Charles the Simple of France.
Ghent	1814	Between United States and England, closing war of 1812.	Saint Germain	1570	Between the Catholic and Huguenots.
Hague	1659	Between England, France, and Holland, with a view to preserve the equilibrium of northern Europe.	San Stefano	1878	This treaty, supplemented by the Congress of Berlin, closed the Russo-Turkish war.
Hamburg	1241	League with Subek, giving rise to the Hanseatic league.	Schoonbrunn	1809	Between France and Austria.
Holy Alliance	1815	A league between the emperors of Russia and Austria and the King of Prussia, by which they ostensibly bound themselves to Christian principles in political matters.	Shimonoseki	1895	Closed the war between Japan and China.
Hubertsburg	1763	Peace between Austria, Prussia, and Saxony.	Thorbe	1406	Settled the terms of the Polish conquest of western Prussia.
Jay's treaty	1794	Between the United States and Great Britain.	Tientsin	1858	Between China and each of the nations of Great Britain, France, Russia, and the United States.
Kiel	1814	Between Denmark, Sweden, and England. Norway and Sweden united.	Tilisi	1807	Between France and Russia, whereby Napoleon restored the Russian monarch one-half of his territories, and Russia recognised the Confederation of the Rhine, and the elevation of Napoleon's brothers, Joseph, Louis, and Jerome, to the thrones of Naples, Holland, and Westphalia.
Kutchuk-Kainardji	1774	Between Turkey and Russia.	Tolentino	1797	Between the Pope and the French.
League, Catholic	1576	Formed to prevent the secession of Henry IV. of France.	Triple Alliance	1668	Between the States-General and England against France for the protection of the Spanish Netherlands.
London	1810	Quadruple treaty between Great Britain, Austria, Prussia, and Russia on the one hand and Turkey, touching the states of Egypt.			Sweden afterward joined the league.
Lunenburg	1801	Between France and Austria and the German empire.			Between Austria, Germany, and Italy.
Madrid	1526	Treaty between Charles V. and Francis I.			

## HISTORIC TREATIES AND ALLIANCES—Continued

NAME OF TREATY	DATE	CHARACTER OR RESULT	NAME OF TREATY	DATE	CHARACTER OR RESULT
<b>Troyes</b>	1420	Between England, France, and Burgundy, whereby Henry V. of England succeeded to the throne of France.		1738	Treaty of peace between Germany and France; Loraine ceded to France, and France guaranteed the Pragmatic sanction.
<b>Ulm</b>	1620	Frederick V. lost Bohemia.		1809	Treaty of peace between Napoleon and Francis II. of Austria. Austria ceded to France the Italian provinces.
<b>Utrecht</b>	1713	Terminated the wars of Queen Anne of England, and secured the Protestant succession in England, and enlarged British colonies in America.		1815	Treaty between Great Britain, Austria, Russia, and Prussia, confirming the treaty of Chaumont.
<b>Utrecht, Union of</b>	1579	Foundations of the Dutch republic laid.		1815	Treaty between the Low countries, and Great Britain, Russia, Austria, and Prussia, agreeing to the enlargement of the Dutch territories, and vesting the sovereignty in the house of Orange.
<b>Valençay</b>	1613	Between Napoleon and Ferdinand VII. of Spain, whereby the latter regained full possession of his kingdom upon agreeing to maintain its integrity.		1815	Federative constitution of Germany signed.
<b>Verdun, Contract of</b>	843	Concluded the war between Lothair, Louis the German, and Charles the Bald, and settled their respective imperial dominions after the death of their father, Louis the Pious.	<b>Warsaw</b>	1683	Alliance between Austria and Poland against Turkey, in pursuance of which John Sobieski assisted in raising the siege of Vienna.
<b>Verona, Congress of</b>	1822	Held by the great powers to adjust Spanish and Grecian disturbances.		1768	Treaty between Russia and Poland.
<b>Versailles</b>	1783	Between Great Britain and the United States to settle American claims.	<b>Washington</b>	1842	Ashburton treaty defined the north-western boundary between the United States and Canada.
	1783	Between Great Britain, France, and Spain.		1871	Between Great Britain and the United States to adjust the Alabama claims.
	1871	Between France and Germany; William I. proclaimed emperor of Germany.	<b>Westphalia</b>	1648	Treaty of peace between France, Germany, and Sweden, terminating the Thirty Years' war.
<b>Vienna</b>	1725	Between the emperor of Germany and the king of Spain, settling the sovereignty over certain parts of the Spanish dominions.	<b>Worms, Concordat of</b>	1122	Between the emperor and the pope, elevating the papal office call the law of investitures.
	1731	Treaty of alliance between Germany, Great Britain, and Holland, by which the Pragmatic sanction was granted, and the Spanish succession settled.	<b>Worms, Diet of</b>	1521	Imperial convocation before whom Luther was summoned and presented.
			<b>Zürich</b>	1859	Closed the dispute between Austria and France and Sardinia.

**Turkey**, or the Ottoman empire, comprises the wide but heterogeneous territories really or nominally subject to the Osmanli sultan, in Europe, Asia, and Africa. These territories which once extended from the Danube to the cataracts of the Nile, and from the Euphrates to the borders of Morocco, were greatly reduced in the nineteenth century.

A small tribe of Turks forced their way into Armenia in the thirteenth century, and helped the Seljuks against the Mongols; in the fourteenth century the Turks under the name of Othman conquered the Seljuik kingdom, and became known as Osmans or Ottomans. By 1336 they pushed their way to the Hellespont; under Murad I. (Amurath) they occupied Adrianople and Philippopolis, received homage from the kings of Serbia and Bulgaria, and practically held all the Balkan peninsula except Constantinople, which, after much fighting, fell before Mohammed II. in 1453. In the same century they conquered Albania, Greece, the Crimea, etc.; and in the sixteenth, Syria, Egypt, Tunis, Hungary, and south Russia, and had wars with the Russians, Persians, and Venetians.

Their star began to decline in the seventeenth century; in 1682 they were driven back from Vienna, and lost Hungary, Transylvania, and Podolia. In the eighteenth century the Russians were their most successful enemies, wresting from them the territories from the Dniester to the Caspian. Greece attained independence in 1828, though Egypt failed to throw off its allegiance. The Crimean war (1854-7) was fought in aid of the Turks against the Russians. The next great crisis, after risings in Herzegovina, Bulgaria, and Servia, was the Russian war of 1877-8. The worst Armenian massacres were in 1895-6. Turkey held her own against Greece in 1897; Crete was put under an autonomous government in 1898. But the Macedonian question was acute in 1903-6.

A form of constitution modeled on that of western European countries was suggested by various reformers from 1860-78, but until 1908 the rule of the sultan was based on the precepts of the Koran. On July 24, 1908, an imperial irade promulgated a constitution which entailed an elective legislature. In consequence of a long period of misrule the sultan, Abdul Hamid II., was deposed in 1909, and he was succeeded by his brother, Mohammed V.

**References.**—Mitchell's *The Greek, the Cretan, and the Turk*; Salmon's *The Fall and Resurrection of Turkey*; Peck's *Turkey*; Broadhead's *Sites of the Middle*; Brindford's *Macedonia*; Freeman's *The*

*Ottoman Power in Europe*; Monro's *Turkey and the Turks*; Warner's *In the Levant*; Lee's *Village Life in Palestine*; Cooke's *Palestine in Geography and History*.

**United States.**—**Exploration.**—The territories now occupied by the United States of America, which were probably visited on their northeastern coast by Norse navigators about the year 1000, continued the sole possession of numerous tribes of Indians (who had earlier and extinct races), until the discovery of America by Columbus, 1492. In 1498 an English expedition, under the command of Sebastian Cabot, explored the eastern coast of America from Labrador to Virginia; the settlement in 1607, when Ponce de Leon landed near St. Augustine in Florida, and explored a portion of that region in a romantic search for the fountain of youth. In 1520, some Spanish vessels from St. Domingo were driven upon the coast of Carolina. In 1521, by the conquest of Cortes and his followers, Mexico, including Texas, New Mexico, and California, became a province of Spain. In 1539-42, Ferdinand de Soto led a Spanish expedition from the coast of Florida across Alabama, and discovered the Mississippi river. In 1584-5, Sir Walter Raleigh sent two expeditions to the coast of North Carolina, and attempted to form settlements on Roanoke island.

**Colonial Settlements.**—A Spanish settlement was made at St. Augustine, Fla., 1565, when the settlements in Massachusetts, New York, then called the New Netherlands, 1613; Plymouth, Mass., 1620. A large part of the country on the great lakes and on the Mississippi was explored by La Salle in 1682; and settlements were made by the French at Kaskaskia and Arkansas Post, 1685; Mobile and Vincennes, 1702. The first effort at a union of colonies was in 1642, when the settlements in Massachusetts, New Hampshire, Rhode Island and Connecticut formed a confederacy for mutual defense against the French, Dutch, and Indians, under the title of "The United Colonies of New England."

**French and Indian War.**—They experienced the benefits of united action in 1754, when an English grant of lands to the Ohio company brought on the French and Indian war—the French claiming, at that period, as the first explorers, northern New England, half of New York, and the entire Mississippi valley. George Washington was sent on his first expedition, to remonstrate with the French authorities; and the colonies being advised to

unite for general defense, a plan for a general government of all the English colonies was submitted and presented; but it was rejected by both the colonies and the crown—by the colonies, who wished to preserve their separate independence, and by the crown from a jealousy of their united strength.

The colonies, however, took an active part in the war. Under Major Washington, they joined General Braddock in his unfortunate expedition against Fort Duquesne, near Pittsburg. They were victorious at the battles of Louisbourg, Ticonderoga, Crown Point, Niagara, and Quebec. The English area was enormously increased after the great struggle with the French, and in 1763, the peace of Paris, France gave up all her claims to Canada and all lands east of the Mississippi and north of Florida. Spain also ceded most of her holdings.

**The Spirit of Democracy.**—The principles of a democratic or representative government were brought to America by the earliest colonists. The colonies themselves were founded by private adventure, with very little aid from government. The Plymouth colony was for eighteen years a strict democracy, and afterward a republic under a charter from the crown. A representative and popular government was established in Virginia in 1620. It was not until the Protectorate and the reign of Charles II. that the colonies were considered as portions of the empire, to be governed by parliament. Then when navigation acts were passed to give English ships a monopoly of commerce, when the produce of the colonies was required to be sent to England, and duties were levied on commodities sent from one colony to another, protests were made against these assumptions; Virginia asserted her right of self-government; and it was not until the English revolution of 1776 that uniform relations with the different colonies were established.

**Introduction of Slavery.**—In 1713, by the treaty of Utrecht, England, which, since the reign of Elizabeth had imported slaves from Africa into her American and West Indian colonies, obtained a monopoly of the slave-trade, engaging to furnish Spanish America, in thirty years, with 144,000 slaves. A great slave-trading company was formed in England, one-quarter of the stock being taken by Queen Anne, and one-quarter by the king of Spain, these two sovereigns becoming the greatest slave-dealers in Christendom. By this monopoly, slavery was extended in, and

to some extent forced upon, all the American colonies.

At this period there was a general feeling of loyalty toward the mother country. The sons of the more wealthy colonists, especially in the south, were educated in England; English literature pervaded the colonies; the British throne was the fountain of honor; the colonies, though distinct and different in origin and character—Puritan in the east, Dutch Reformed in New York, Quaker in Pennsylvania, Catholic in Maryland, and Church of England in Virginia—were united by language, common ties, fears, and interests.

**Union and Independence.**—In 1761 the enforcement of the navigation act against illegal traders, by general search warrants, caused a strong excitement against the English government, especially in Boston. In 1766 the passing of an act of parliament for collecting a colonial revenue by stamps caused general indignation, and led to riots. In 1766 the stamp act was repealed; but in 1767 duties were levied on glass, paper, printer's colors, and tea. This renewed attempt met with a general resistance, and a number of tea were thrown into the harbor of Boston. To punish this measure, parliament passed the Boston port Bill, 1774, by which the chief town of New England was no longer a port of entry, and its trade transferred to Salem.

To enforce the act of the government, a fleet conveying 10,000 troops was sent from England, while the colonists prepared to resist the unconstitutional assumptions of the mother country. The first encounter took place at Lexington, April 19, 1775. A congress of the colonies assembled at Faneuil-hall, which resolved to raise an army of 20,000 men, and appointed George Washington commander-in-chief. June 17, Bunker Hill, in Charlestown, near Boston, where 1,500 Americans had barely intimated resistance, was taken by assault by the British troops, but with so heavy a loss that the defeat had for the Americans the moral effect of a victory. After a few days' privation and suffering, the British were compelled to evacuate Boston, carrying away in their fleet to Halifax 1,500 loyal families.

The British government now put forth a strong effort to reduce the colonies to submission. An army of 55,000 men, including 17,000 German auxiliaries (Hessians) was sent, under the command of Sir William Howe, to put down this "wicked rebellion." On June 7, 1776, Richard Henry Lee, of Virginia, offered a resolution in congress, declaring that "the united colonies are, and ought to be, free and independent states; that they are absolved from all allegiance to the British crown; and that all political connection between them and the state of Great Britain is, and ought to be, totally dissolved."

**Declaration of Independence.**—This resolution, after an earnest debate, was adopted by the votes of nine out of thirteen colonies. A committee, consisting of Thomas Jefferson, John Adams, Benjamin Franklin, Thomas Paine, and Robert R. Livingston, was instructed to prepare a declaration in accordance with the above resolution; and on July 4, 1776, the Declaration of Independence received the assent of the delegates of the colonies, which thus dissolved their allegiance to the British crown, and declared themselves free and independent states, under the general title of the Thirteen United States of America.

**War of the Revolution.**—The first campaign of the war was disastrous for the Americans, and for the moment the prospects of the cause of freedom looked gloomy. But in the midst of the general depression, Washington, sustained by the firmness of Congress, maintained his fortitude and confidence in final success. Carefully watching the opportunity to retrieve the credit of the American army, he defeated the British forces at Trenton, December 25, 1776; and his exploits in the following campaigns revived the spirit of the nation, and confounded and dismayed the enemy.

In 1780 England sent an additional force of 35,000 troops, and a strong effort was made to subjugate the Carolinas, where the

war became of a bitter partisan character, and was conducted with spirit by Sumter, Marion, and other southern chieftains. Lord Cornwallis, with a large army, retreated from Charleston, through North Carolina, and arrived in Virginia, where he was confronted by Lafayette, Wayne, and Steuben. In the month of September the British were driven upon the coast with a powerful French fleet, and 6,000 soldiers of the élite of the French army, under Count de Rochambeau. Cornwallis was obliged to fortify himself at Yorktown, Blockade by the Count de Grasse, and besieged by the allied army of French and Americans, waiting for Sir Henry Clinton to send him relief from New York. On October 19, 1781, he was compelled to surrender his army of 7,000 men.

This event produced such a change of feeling in England as to cause the resignation of the ministry, and the dispatch of General Sir Guy Carleton to New York with an offer of terms at Peace. The preliminaries were signed at Paris, November 30, 1782; and on September 3, 1783, peace was concluded between England and France, Holland, and America. The independence of the thirteen several states was acknowledged, with a liberal settlement of territorial boundaries. In April a cessation of hostilities had been proclaimed, and the American army disembarked at New York, which had been evacuated by the English through the whole war, was evacuated November 25th; and on December 23 General Washington took leave of his companions and returned to the hands of Congress his commission as commander.

**The Constitution.**—In 1787 a national convention met at Philadelphia, May 14, and after four months' deliberation adopted the present constitution of the United States, and submitted it to the people for ratification. After a thorough discussion, lasting in some of the states for two or three months, the constitution was accepted by all of them; first by Delaware, December 7, 1787, and lastly by Rhode Island, May 27, 1790. This constitution, which was the result of compromise by agreement, came into operation in March, 1789, and George Washington was elected the first president.

**Organization of the Government.**—The Congress appointed by the thirteen states then proceeded to impose duties, establish a federal judiciary, organize the executive administration, fund the debt of the United States, and establish a national bank. In 1793 Washington was unanimously reelected president. During his administration the states of Vermont, Kentucky, and Tennessee were admitted into the union.

In 1796 Washington, worn and irritated by partisan conflicts and criticisms, refused a third election, and issued his farewell address to the people of the United States, warning them against the dangers of party-spirit and disunion, and giving them advice worthy of one who was said to be "first in war, first in peace, and first in the hearts of his countrymen." John Adams was reelected president; and Thomas Jefferson, the second choice of the people for the presidency became according to the rule at first adopted, vice-president. In 1798 the commercial republics of France, and the assertion of the right to search and capture American vessels, nearly led to a war between the two republics. In 1799 the nation, without distinction of party, mourned the death of Washington; and, in the following year, the seat of government was removed to the city he had planned for a capital, and which bears his name.

**Fall of the Federalists.**—The partiality of Mr. Adams toward England, the abolition of a federal army, and the passing of the alien and sedition laws, by which foreigners could be summarily banished, and abuse of the government, by special elections, had punished caused great political excitement, and such an increase of the Republican, or, as it was afterward called, the Democratic party, that the president failed of reelection in 1801; and being no election by the people, the House of Representatives, after thirty-five ballottings, chose Thomas Jefferson, the Republican candidate, with Aaron Burr for

vice-president; and the offices of the country were transferred to the victorious party.

**The New Domestic Policy.**—Internal duties, which a few years before had led to an insurrection in Pennsylvania, called the whisky insurrection, were abolished, and the alien and sedition laws repealed. Tennessee, Kentucky, Vermont, and Ohio had now been organized as states, and admitted into the union. In 1803 the area of the country was more than doubled by the purchase of Louisiana—the whole region between the Mississippi and Rocky mountains—from France for \$15,000,000. The infant navy was strengthened by a successful war with Tripoli. In 1805 Mr. Burr was elected for a second term; but Burr, having lost the confidence of his party, engaged in a conspiracy to seize upon the Mississippi Valley, and found a new empire, with its capital at New Orleans. He was tried for treason, but not convicted.

The commerce of America at this period was highly prosperous, her ships enjoying much of the carrying trade of Europe; but in May, 1806, England declared a blockade from Brest to the Elbe, and Bonaparte, in revenge, declared the blockade of the coasts of the United Kingdom. American vessels were captured by both parties, and were searched by British ships for British subjects, and those suspected of having been British were sent to England, according to the doctrine, "once a subject always a subject," impressed into the naval service.

Even American men-of-war were not exempted from this proceeding. The British frigate *Leopard* meeting the American frigate *Chesapeake*, demanded four of her men, and on refusal, fired into her, and the surprised *Chesapeake* struck her flag. British ships were thereupon forbidden United States harbors.

Jefferson, following the example of Washington, declined a third election; and, in 1809, James Madison became president. The French decrees, prejudicial to neutral commerce, were revoked in 1810; but the English continued a source of loss and irritation, while the American government refused to furnish service in British vessels. The feeling was increased by a night encounter between the American frigate *President* and the British sloop-war *Little Belt*, on May 16, 1811.

**War of 1812.**—On April 18, 1812, Congress was again declared by Congress, preparatory to a declaration of war against Great Britain July 19, for which Congress voted to raise 25,000 enlisted soldiers, 50,000 volunteers, and 100,000 militia. General Hull, with 2,000 men at Detroit, invaded Canada; but on being met by a small force of British and Indians, under General Brock, recrossed the river, and made a shameful surrender. He was sentenced to death for his cowardice, but pardoned by the president. A second invasion of Canada was made near Niagara by General Van Rensselaer. One thousand American militia stormed the heights of Queenstown, and the British general, Brock, was killed; but reinforcements arriving opportunely, the heights were retaken. American losses during the war were, however, compensated by victories at sea. August 19 the United States frigate *Constitution* captured the British frigate *Guerriere*; October 18 in *Appomattox* took the British frigate *United States* captured the *Macedonian*; December 29 the *Constitution* took the *Jean*. American privateers took 300 British vessels, and 8,000 prisoners.

In 1813 General Prevost crossed the Detroit river with a considerable force of British and Indians, and defeated General Winchester, with the usual results of savage warfare. In April 1814 the British took 4,700 men captured York (now Toronto), and about the same time another American force of 800 men was defeated with great loss by the British under General Rensselaer. The remainder of this campaign was wholly favorable to the Americans. The attempt of the British general, Prevost, on Sackett's Harbor was repulsed; the squadron on Lake Erie, commanded by Commodore Perry, captured the British frigate *Lawrence*, and the American flotilla of nine vessels, fifty-four guns; and this latter success enabled General

Harrison to invade Canada, where he defeated General Proctor in the battle of the Thames, in which the great Indian warrior-chief Tecumseh was killed.

Later, another invasion of Canada was attempted; and York was taken by General Dearborn; and an unsuccessful attempt was made to take Montreal. Villages were burned on both sides. The British also destroyed American shipping in Delaware bay. At the same period General Jackson defeated the Creek Indians in Alabama and Georgia, who had been excited to make war upon the frontier settlements.

In 1814 General Scott and Ripley crossed the Niagara, and sharp action, with no decisive results, were fought at Chippewa and Lundy's Lane, close by the great cataract. General Wilkinson also invaded Canada on the St. Lawrence, but was easily repulsed. A British invasion, via Lake Champlain, by General Sir George Prevost, with 14,000 men and a flotilla on the lake, was not successful. On the 6th of September, the British was defeated at the battle of Plattsburg, while the army was repulsed on shore, and retreated with heavy loss.

On August a British fleet ascended Chesapeake bay, took Washington but slight resistance, and burned the government buildings. A subsequent attack on Baltimore was unsuccessful. New York, New London, and Boston were blockaded, and a large expedition was sent against Mobile and New Orleans.

On January 8, 1815, General Packenham advanced with 12,000 men against the latter city, which was defended by General Jackson, at the head of 6,000 militia, chiefly from Tennessee and Kentucky, aided by a small force of artillery. The militia were sheltered by a breast-work, and the British assault was met with so deadly a fire of riflemen, that it was repulsed, with the loss of General Packenham and several others, with 700 killed and 1,000 wounded; while the entire American loss is stated to have only amounted to 71. This ill-planned and unfortunate action was fought a month after the peace had been concluded between England and America, and was followed by two naval actions in February and March.

Although during this contest fortune at first favored the Americans on the high seas, she changed sides completely from June, 1813, as if to counterbalance the disasters of the British on land. June 1 the *Chesapeake* was taken by the *Shannon*; June 3 the *Groveland* and *Essex* were captured by British gunboats; the *Aryus* was taken by the *Peacock* August 14; the *Essex* by the *Phoebe* and *Cherub* March 29, 1814; the *President* by the *Endymion* January 15, 1815; the only counterbalancing success being the sinking of the British sloop *Acorn* by the *Porpoise* September 8.

In December, 1814, the Federalists of New England held a convention at Hartford in opposition to the war and the administration, and threatened a secession of the New England states. In 1818 Commodore Porter, who had taken a distinguished part in the recent war, commanded an expedition against the Algerians—whose corsairs had preyed on American commerce in the Mediterranean—and dictated terms to Algiers, Tunis, and Tripoli.

The Democratic-Republican party having brought the war to a satisfactory conclusion, the Federalists of New England, in 1816, James Monroe was elected to the presidency, almost without opposition, in what was termed "the era of good feeling." A rapid emigration from Europe and from the Atlantic states to the richer lands of the west, had in ten years added six new states to the union. Difficulties arose with the warlike southern Indian tribes, whose hunting-grounds were invaded; and General Jackson, sent against the Seminoles, summoned to his aid the Tennessee volunteers who had served under him against the Creeks and at New Battle, defeated them, pursued them to Florida, took Pensacola, and banished the Spanish authorities and troops. In 1819

Florida was ceded by Spain to the United States.

**Missouri Compromise.**—In 1820 Alabama and Maine, a slave and a free state, were added to the union; and the question of the admission of Missouri arose in Congress—the question of its admission as a slave state. At the period of the Revolution slavery existed in all the states except Massachusetts; but it had gradually been abolished in the Northern and Middle states, except Delaware, and excluded from the new states between the Ohio and Mississippi by the terms on which the territory had been surrendered by Virginia to the union.

Under the constitution, slaves were not counted in full as a represented population; but by a compromise, three-fifths of their numbers were added to the whites. The slave states were almost exclusively agricultural, with free-trade interests. The free states were encouraging manufactures by protection. The two sections had already entered upon a struggle to maintain the balance of power against each other. After an excited contest, Missouri was admitted, with a compromise resolution, that in future no slave state should be erected north of the parallel of 36 degrees 30 minutes north latitude, the northern boundary of Arkansas.

During the second term of Mr. Monroe, in 1824, General Lafayette visited America, and was everywhere received with great enthusiasm.

In the presidential election of 1824 there were four candidates—John Quincy Adams, Andrew Jackson, Henry Clay, and William H. Crawford. There being no choice by the people, the House of Representatives chose Mr. Adams; John C. Calhoun being elected vice-president. Party and sectional feeling became stronger. Mr. Adams and Mr. Clay, who had heretofore acted with the party of Jefferson and Madison, were henceforth identified with what was called the National Republican, and later, the Whig, and finally, in union with the Anti-Slavery Republican party.

**National Democracy.**—The four years of Mr. Adams, during which there were violent contests on protection and the powers of the federal government to carry out public works with states, ended with a presidential election contest, which resulted in the triumph of the Democratic party, and the election of Andrew Jackson, with John C. Calhoun as vice-president. The bold, decisive, and impetuous character of General Jackson was shown in a general removal of those who held office, down to small postmasters and tide-waters, under the late administration, and the appointment of his own partisans. An act for the rechartering of the United States bank was met by a veto of the president, who declared it unconstitutional and dangerous.

In 1832 an Indian war, called the Black Hawk war, broke out in Wisconsin; but the passing of a high protective tariff act by Congress caused a more serious trouble. The southern Carolina declared the act unconstitutional, and therefore null and void, threatening to withdraw from the union if any attempt were made to collect the duties on foreign importations. The president prepared to execute the law by force. Mr. Calhoun resigned his office of vice-president, and asserted the doctrine of state-rights, including the right of secession, in the senate. A compromise bill, known as the Nullification act, was settled by a compromise bill, introduced by Henry Clay, providing for a gradual reduction of duties, until 1843, when they should not exceed 20 per cent ad valorem.

The popularity of General Jackson excited his reelection by an overwhelming majority against Henry Clay, the leader of the Bank, Protection, and Internal Improvement party; and he entered upon his second term with Martin Van Buren of New York as vice-president. The removal of the government deposits from the United States bank to certain state banks led to the failure of the bank, and after some years, the plan of Mr. Van Buren's plan of an independent treasury.

The Cherokee Indians in Georgia, who had attained to a certain degree of civilization, appealed to the president for protection against the seizure of their lands by the state; but they were told that he "had no power to oppose the assertion of the sovereignty of any state over its who may be within its limits"; and the Indians were obliged to remove to the territory set apart for them west of the Mississippi. In 1835 the Seminoles war broke out in Florida; and the struggle, insignificant in numbers, under the early leadership of Osceola, kept up hostilities for years, at a cost to the United States of several thousands of men and some \$50,000.

In 1837 Martin Van Buren succeeded General Jackson in the presidency. His term of four years was a stormy one, from the great financial crisis of 1837, which followed a period of currency expansion and wild speculation. All the banks suspended payment, and the great commercial cities threatened insurrection. Mr. Van Buren was firm in adhering to his principle of collecting the revenues of the treasury, and of separating the government from all connection with the banks. His firmness in acting against the strong sympathies of the northern and western states, and his rejection of 1837-8 also damaged his popularity; and in 1840 the election of General Harrison, with John Tyler for vice-president, was one of unexampled excitement, characterized by immense popular gatherings, political songs, the use of symbols, and the participation of both sexes to a degree hitherto unknown in America. The Whigs triumphed in nearly every state; General Harrison was inaugurated March 4, 1841; and the rush to Washington for offices was as great as the election had been exciting and remarkable.

Worn down by the campaign, and the office-seekers, General Harrison died in a month after his inauguration, and was succeeded by John Tyler, who, having been a Democrat, was not popular with the Whigs. He seems to have reverted to his former political principles. He vetoed a bill for the establishment of a national bank and other measures of the party by which he had been elected, and was succeeded by Daniel Webster, secretary of state, and others, Democratic or neutral, were appointed in their place.

During Mr. Tyler's administration the northeastern boundary question, which nearly occasioned a war with England, was settled by Mr. Webster and Lord Ashburton; a difficulty amounting almost to a rebellion was settled in Rhode Island; but the most important question agitated was that of the annexation of Texas. This annexation was advocated by the south, as a large addition to southern and slave territory; and, for the same reason, opposed by the Whig and Anti-slavery parties of the north. Besides, the independence of Texas, though acknowledged by the United States Senate, had been acknowledged by Mexico, and its annexation would be a *casus belli* with that power. The recent admissions of Iowa and Florida into the union had kept the balance of power between north and south, but Texas would be an advantage to the south. But the gain of territory, and a contempt for Mexico, overcame these objections, and in 1845 Texas was formally annexed to the United States, and James K. Polk of Tennessee succeeded Mr. Tyler in the presidency.

**The Mexican War.**—M. Almonte, the Mexican minister at Washington, protested against the annexation of Texas, as an act of aggression; and to guard against a threatened invasion of Texas, General Zachary Taylor was ordered, with the United States troops of his military district, to its southern frontier. The Mexicans crossed the Rio Grande, and commenced hostilities April 26, 1846. General Taylor moved promptly forward, and won the victories of Palo Alto, Resaca de la Palma, Monterrey, and Buena Vista, and gained great odds—20,000 to 4,750—the hard-fought battle of Buena Vista, a victory that excited great enthusiasm. In the meantime, General Taylor had been succeeded by General Winfield Scott, in northern Mexico; General Kearney to New Mexico; and Captain Fre-



Cumberland and Tennessee rivers (February 3), which led to the occupation of Nashville, the capital of Tennessee, henceforth held by the federalists—Andrew Johnson, formerly governor and senator, having been appointed military governor. Roanoke Island was also captured, on the coast of North Carolina. In March General McClellan, who had succeeded the aged Lieutenant-General Scott as commander-in-chief, commenced a movement on Richmond, the seat of the confederate government, now defended by General Lee.

On the 8th of March, the confederate iron-clad *Virginia*, constructed from the United States steamer *Merrimack*, which had been sunk at Norfolk, and raised by the confederates, attacked the federal fleet in Hampton roads, and in forty minutes sunk the *Confederate*, and set on fire and captured the *Congress* (frigate); while the other vessels took refuge in shoal water or in flight. The next day, the *Monitor*, a war-vessel of entirely novel construction, low and flat, with a revolving turret, invented by Capt. Ericsson, engaged the *Virginia*. The battle lasted two hours without result.

On the 6th of April a sanguinary but indecisive battle was fought near Corinth, Ala., the federalists being protected by gunboats. Soon after, Admiral Farragut, with a fleet of forty-five vessels, entered the Gulf at the mouth of the Mississippi river, and took New Orleans; while the armies and gunboats captured the fortifications on the upper part of the river as far as Memphis, Tenn., and the means General McClellan had besieged and taken Yorktown, and fought his way up the peninsula of the James river, until within five miles of Richmond, when he was beaten in a series of sanguinary battles, and driven, with a loss, in six days, of 15,000 men, to the shelter of his gunboats; while Generals Banks and Pope, sent to cooperate with him in the siege of Yorktown, were defeated and driven back by General "Stonewall" Jackson.

On the 1st of July the president called for 300,000, and August 4, 300,000 more men for the federal army. Congress abolished slavery in the District of Columbia, prohibited it in the territories and passed a resolution to compensate the masters in any State that would abolish slavery. He also authorized the president to employ negroes in the army, and to confiscate the slaves of rebels. In August the federalists were a second time defeated at Bull Run, and General Lee crossed the Potomac into Maryland, creating great alarm in Washington, and even in Philadelphia. General McClellan made a rapid march, and met him at Sharpsburg or Antietam. A drawn battle resulted in the retreat of General Lee, covering an immense train of provisions, horses, cattle, etc., which was probably the object of his expedition. A confederate invasion of Kentucky, about the same time, was attended with the same results. Another advance on Richmond was led by General Burnside, who had been shot, and General McClellan; but he was confronted by General Lee at Fredericksburg, and defeated in one of the most sanguinary battles of the war.

President Lincoln issued a proclamation declaring the freedom of all the slaves in the rebel states, which it was expected might cause them to rise against their masters; but it was without result. While the army of the Potomac was vainly endeavoring to advance on Richmond, the army of Tennessee, under General Rosecrans, with its base at Nashville, was trying to sever the Atlantic from the Gulf states, and cut the railways that supplied the confederate armies in Virginia. At Murfreesboro, Tenn., the Confederate General Bragg attacked General Rosecrans with the usual result of heavy losses on both sides, but no decided victory.

**Events of 1863.**—Early in May, 1863, General Hooker, who had succeeded General Burnside in the command of the army of the Potomac, crossed the Rappahannock, and was defeated by General Lee at Chancellorsville with great slaughter; but this victory was dearly bought by the loss of General

Jackson, mortally wounded in mistake by his own soldiers. General Lee now took the offensive, and invaded Pennsylvania, advancing as far as Harrisburg; but being met by General Meade, the new commander of the army of the Potomac, he was driven to a strong position at Gettysburg without success, and was compelled to recross the Potomac.

In the meantime the two principal fortresses of the Mississippi, Vicksburg and Fort Hudson, attacked by land and water, after a long siege, were starved into capitulation, and the entire river was open to federal gunboats. Charleston, which had since the beginning of the war, was now strongly besieged—its outworks, Fort Gregg and Wagner, taken, Fort Sumter battered in pieces, still held as an earthwork, and shells thrown a distance of five miles into the inhabited part of the city. In September, General Rosecrans had taken the strong position of Chattanooga, and penetrated into the northwest corner of Georgia, where he was disastrously defeated by General Bragg at the battle of Chickamauga.

At this period there was great peace-mongering in the north, and in New York against the conscription and the negroes; while the banks having suspended specie payments, the paper money of both federal and confederates was largely depreciated. The confederates were, however, cut off from all foreign aid, except what came to them through the blockade, and their own resources, both of men and material, were becoming exhausted. The railways were worn, many destroyed or occupied by the federalists, and it became difficult to transport supplies and feed armies. The federalists had command of the sea, and access to all the markets of Europe.

**Events of 1864.**—At the commencement of 1864 the federalists held, including the garrisons on the Mississippi, nearly 100,000 prisoners of war, and 40,000 federal prisoners, whom they could feed with difficulty, and who suffered great hardships. General Ulysses S. Grant, who had been successful at Vicksburg, was appointed commander-in-chief of the federal armies, and commenced a vigorous campaign over an immense area—in Virginia, the Carolinas, Georgia, Louisiana, and Arkansas, with the determination "to crush continuously against the armed forces of the enemy and his resources, until by mere attrition he should be forced to submit." Of the confederates, General Lee defended Petersburg and Richmond. General J. E. Johnston opposed the army of Tennessee at Dalton, Ga.; General Forrest was in Mississippi; General Taylor and Kirby-Smith commanded in Louisiana and Arkansas. In February, General Sherman marched from Vicksburg, making a destructive raid across northern Mississippi to Alabama. In March the federalists had 1,000,000 of men raised and provided for. The entire confederate forces probably numbered 250,000.

The army of the Potomac, commanded by General Grant, under the personal superintendence of General Grant, covered Washington, and advanced toward Richmond. General Butler advanced from Fortress Monroe up the James river, and General Sigel marched up the Shenandoah. Sherman united the armies of Tennessee, Cumberland, and Ohio, at Chattanooga, where he had nearly 100,000 men and 250 guns. General Banks and 60,000 men in Louisiana. In March General Banks moved up the Red river, toward Shreveport, but was defeated on the 24th, and driven back to New Orleans. The campaign of the Shenandoah valley commenced, and the army of the Potomac fought a series of battles at the Wilderness, Spotsylvania Courthouse, Jericho's Ford, North Anna, and Cold Harbor, with terrible losses. After the repulse, the federalists took up a new position further south, with a new base, until they had made half the circuit of the confederate capital. General Breckinridge defended Sigel in the Shenandoah valley, and once more threatened Washington. General Sheridan, with a strong cavalry force, drove back the confederates, and laid waste the

valley. In September General Sherman, advancing with a superior force, captured Atlanta. General Hood, superseding Johnston in the command of the confederates, was outgeneraled and beaten. While he marched against the city, General Sherman's base, and attack Nashville, where he was defeated, Sherman burned Atlanta, destroyed the railway, and marched boldly through Georgia to Savannah. The confederates made straggling victories, but with no permanent result.

**Events of 1865.**—The federalists made a new draft for 500,000 men. Expeditions were organized against Mobile, the most important confederate port, was taken by a naval and military expedition. Savannah and Charleston, approached in the rear by Sherman, were evacuated. The Cavalry raids cut off the railways and canal that supplied the confederate army in Petersburg and Richmond. Finally, on March 29, 1865, a series of assaults was made upon the confederate works, during ten days of almost continual fighting, until the confederates were worn down with fatigue. Richmond and Petersburg were evacuated April 2; and on the 9th of April seven, General Lee surrendered at Appomattox Courthouse, his army numbering 28,000.

At this period it is said that there was not less than 100,000 prisoners of war, the confederates striving to fight a single battle. On the 12th Mobile surrendered with 3,000 prisoners and 300 guns. Then General Johnston, in North Carolina, surrendered a few days after to General Sherman; and the trans-Mississippi confederate army followed his example.

Mr. Lincoln was in 1865 triumphantly re-elected to the presidency, with Andrew Johnson as vice-president. On April 14, while the north was rejoicing over the capture of Richmond and the surrender of the confederate armies, the president was assassinated at the theatre of Washington, by John Wilkes Booth, an actor. Andrew Johnson became president. Jefferson Davis and the members of the confederate government were supposed to be privy to the assassination of President Lincoln, and large rewards were offered for their apprehension. Mr. Davis was captured in Georgia, and placed in Fortress Monroe, but was released without trial in May, 1865.

**Reconstruction.**—An amendment to the constitution, forever abolishing slavery in the states and territories of the union, was declared ratified by two-thirds of the states December 18, 1865. The vast change in the organization of the republic made by this new fundamental law was completed by the fourteenth and fifteenth amendments, passed in 1865 and 1870, which gave to the former slaves all the rights and privileges of citizenship. The seceded states were readmitted to the union on condition of their adhesion to the constitution as thus amended.

In 1867 the United States secured by purchase the whole of Russian America. In 1872 the Alabama Court of Arbitration gave its decree in favor of the United States, while the same year the arbitration between Great Britain was settled on the same side by the emperor of Germany. The outrages of a secret organization known as the Ku-Klux Klan, in the southern states, retarded the passing of an act in 1871, giving cognizance of such offences to the United States courts.

The year 1876, memorable in the annals of the republic, the hundredth anniversary of the Declaration of Independence, was celebrated by a great centennial exhibition at Philadelphia. The presidential election of the same year was more than usual interest. General Ulysses S. Grant, chosen president in 1869, had been re-elected in 1873. When the result of the keenly contested election toward the close of the year was known, it seemed as if fortune had favored the Democratic party. But many of the returns from the various states were disputed; and for several months the interest excited by the presidential election was kept alive, selected from the Senate, the House of Representatives, and the judges of the supreme court, was appointed to examine the election

returns. The result was that Mr. Hayes, the Republican candidate, was declared to have been elected president, and inaugurated March 4, 1877.

President Hayes, soon after his inauguration, withdrew the federal troops from the south, saying that it was time to let the people govern themselves. The effect in the contested states was to return the Democratic governments to power, yet by 1879 the Republican senate was ready to approve of the president's course by agreeing to a law forbidding the use of federal troops at the polls. The year 1877 marks the close of an era in American history which began with the slavery dispute in 1850. During this time slavery was abolished and the doctrine of secession abandoned. With the restoration of home rule the country entered upon a period of united activity hitherto unattainable.

**Economic Problems.**—Since that time the issues have been for the most part of an economic character. Opinion has been divided upon problems of money, taxation, tariff, civil service reform, and the control of corporations, but with respect to party divisions the Republicans, either in the national legislature or in the executive chair, have been, except for two separate periods, not four years continuously in control to the present time (1911). Legislation has been throughout in favor of high protection, and with slight deviation on the side of sound money. Government, both national and state, has become more effective, and the history of the period is chiefly concerned with the persons and processes by which these results have been attained.

Prosperity was not uniform. The rush of activity and speculation after the war reached a crisis in 1873. Two or three years of depression were followed by industrial success until 1893, when another crash caused a halt. The country presently recovered and no interruption to prosperity has since occurred. Legislation has been concerned largely with economic questions, and party lines have been curiously obliterated on many economic questions.

A case in point was the demand for the inflation of the silver currency in 1878. The market price of silver had fallen to a ratio of about 20 to 1 in gold. The mine owners attributed this to the fact that the government had ceased to coin dollars in 1873, and the Greenback party, which desired more currency on principle, joined in the demand for increase of silver; this party (which later fused with the Labor party) also demanded the withdrawal of all bank currency in favor of national currency, and wished to have that part of the national debt not specifically payable in gold paid in currency. The party had for a time considerable strength in Indiana, Illinois, Kansas, Iowa, and Michigan. The Bland bill was passed, which at least two millions and not more than four millions per month to be coined into dollars at a ratio of 16 to 1. This continued for twelve years; silver passed its value for value like treasury notes. The national credit constantly improved. The debt was annually reduced in large payments, and in 1879 the government resumed specie payments.

In 1880 James A. Garfield of Ohio was elected president after a useful career in his state, in the war, and in Congress; but he had been only a few months in office when he was shot by an insane office-seeker, and after a lingering illness died (Sept. 19, 1881). Chester A. Arthur, of New York, vice-president, succeeded, and continued the Republican policy in a conservative manner. A halt was called in the appointment and removal from office for political reasons. The Jacksonian system had grown to a point where Republicans were removed to make place for henchmen of a rival candidate, and office-holders were regularly assessed for campaign expenses. The civil service act of 1883 provided examinations for the classified service, prohibited removals for political reasons, and forbade political assessments by a government official or in a government building. Out of this act the present system

has grown chiefly by expansion of the classes of officials to be affected.

**Democrats in Power.**—In 1884 the prosperity of the country had so increased that the treasury that the tariff became a real issue between parties. Two years before a commission had made wide inquiries through the country, and the Congress had been increasing rather than diminishing duties. The Democrats nominated Grover Cleveland, who as mayor of Buffalo and governor of New York of the country, had so far exceeded the hope of a purification of politics he attracted many independent voters, and defeated James G. Blaine, who in the course of a long and brilliant Congressional career had become as well as a devoted follower.

Cleveland was supported by a Democratic House, but the Senate was Republican; consequently tariff matters were at a standstill, but important laws on other subjects were enacted during his first term. The death of Vice-President Hendricks brought forward the presidential succession bill. In 1885 in case of a vote of both great officers, the president of the Senate and then the speaker of the House would succeed, but if neither house had elected a presiding officer, there would have been no one to take up the duties of president. The law of 1886, therefore, provided that the succession should first fall upon the secretary of state and after him, in order, the secretaries of war, treasury, the attorney-general, postmaster-general, secretaries of navy and interior. The continuation of the public policy desired by the party which elected the president would be thus assured.

The electoral count law prevented the recurrence of a situation like that of 1876. Hereafter each state shall be the judge of its own electoral vote, but if through opposing courts the state is unable to decide, the matter must be settled by joint resolution of the two houses of Congress.

The Interstate Commerce Commission was established in 1887. Hitherto Congress had given railways free rein, but the formation of huge systems and the combination of interests seemed to be competition for national legislation. The commission was given very limited powers, but it forms an interesting landmark in the interpretation of the commission to be placed in the constitution just a century before.

Mr. Cleveland showed great independence in vetoing private pension bills and other laws which he deemed unsuitable, sending back about three hundred without his signature. He stood in advance of his party upon the tariff question, particularly toward the end of his term, when the surplus revenues of the country exceeded \$55,000,000. The public debt was paid off so far as it was due, and the tariff, with its inequalities and war-time rates, went on piling up funds. "It is a consoling circumstance," he said, "that the phrase that caught the public ear," The President devoted to this subject the whole of his annual message to the Fifty-fifth Congress, but the Mills bill formed on policy was blocked in the Senate. Rather against the desires of the Democratic leaders, the tariff became the paramount issue in the presidential campaign of 1888.

**Republican Party Again in Power.**—Mr. Cleveland was re-nominated without opposition, and Benjamin Harrison of Indiana was put forward upon a strong protective platform. The Republicans were re-elected, and Mr. Harrison and by a vote of 233 against 168, although his popular vote was less than that of his opponent. Both houses of Congress were again Republican, and the result was taken as a mandate from the people to raise the tariff still more. In 1890 the McKinley bill increased the duties to an average of 50 per cent, but with some concessions to free trade and the provision for possible reciprocity with other countries.

The dependent pension bill gave a pension to any soldier or sailor who had served ninety days and was unable to earn a living. Widows, children and dependent parents were included. The pension list was nearly doubled, and the expenditures presently reached \$158,000,000 for that item alone.

The Bland bill was replaced by the Sherman bill for the purchase of an increased amount of silver. To keep up the price four and a half million ounces of bullion must be bought and stored in the treasury every month. Much valuable minor legislation stands to the credit of this Congress, but it is the decline of the surplus was spent. There was considerable popular discontent, which made itself felt in the ensuing presidential election.

**Cleveland Returned.**—President Harrison was re-elected, and Mr. Cleveland, in spite of the machinations of the politicians whom he had offended, was put forward again by the Democrats. The chief issue was again the tariff, but silver had near setting it aside. The decline of silver had not been arrested and there was a great call from the west and south for free coinage. Mr. Cleveland pronounced against it and offended many supporters, but there was also defection in the Republican party. A third party now appeared in formidable numbers. Hitherto the recent political groups had not drawn seriously upon the old parties, but socialist views of various kinds now united in the "Populist" party and profited by the cry for silver. Their cause was recovered over a million votes. The popular vote for Cleveland and Harrison were each over five millions, but Cleveland was elected by a large majority of electoral votes. The Congress in both branches was heavily Democratic.

When President Cleveland returned to office the situation was quite different from that of his first entry. Instead of a surplus there was stringency. Labor discontent and business depression were evident. Congress was called in special session to repeal the silver purchase bill and to protect the gold standard against silver currency. The project met obstruction in the Senate, where the mining states could make their votes the most effective, but eventually the purpose was accomplished.

The business depression became a financial panic in 1893, and the uncertainty lasted for several years. As the Democratic party was in power, the measure was not immediately thrown upon it; nevertheless, the leaders went forward with a revision of the tariff. The Wilson bill, as it came from the House, placed a small tariff on many commodities, substantially reduced the rates. In the Senate, Democratic though it was, the measure was altered beyond recognition; coal and iron ore were taken from the free list, and many duties raised. Mr. Cleveland was displeased, but as the duties were somewhat lower than the McKinley act he permitted the bill to become a law without his signature. An income tax law was passed, but was declared unconstitutional by the Supreme Court. A bill to coin the silver of the "seigniorage" was vetoed by the President.

No sufficient legislation having been enacted, the secretary of the treasury was obliged to take the unusual measure of borrowing money to keep up the gold reserve to the proper level. The Congress elected in 1894 reversed the majority in the House and made parties about equal in the Senate; consequently legislation during the balance of Mr. Cleveland's term was insignificant.

The Monroe doctrine came to life again suddenly in 1895 owing to a boundary dispute between Great Britain and Venezuela. Repetition of the doctrine had recently made to the English government, and the suggestions for a settlement having been as often declined, Mr. Cleveland sent a sharp message to Congress recommending the appointment of a commission to determine this boundary. The measure if carried out meant eventual war, but Congress voted unanimously for the commission. The British attitude, however, rapidly changed, and the result of the commission had finished its work the matter was settled with Venezuela by arbitration.

**The Silver Campaign of 1896.**—The demand for the free coinage of silver increased to such an extent that it became the chief issue in the presidential election of 1896. The Democratic party nominated William J. Bryan of Nebraska and gave the silver question the

foremost place in its platform. With them were the Populists and certain other small groups. The Republicans would have preferred to make the tariff the issue, but spoke clearly for sound money. The National Democratic party, or "Gold Democrats," drew some votes from the old party, but everywhere the mass of sound money voters cast their ballots directly for William McKinley, who was elected by a heavy majority.

Putting aside all considerations of persons and parties, the promptness with which the Americans rose in behalf of conservative finance was an interesting phenomenon. With a Republican congress, there naturally followed a return to the protective method in customs duties. The Dingley tariff bill was intended not only to restore the depleted revenues, but to maintain more than ever a certain theory of economic prosperity.

**The Spanish-American War.**—The chief event of this administration was the war with Spain on account of Cuba, which broke out in 1898. A rebellion in Cuba had been in progress since 1895 and was being suppressed by the Spanish authorities with great and unnecessary cruelties, bringing death to 250,000 Cubans. Repeated warnings from America had no effect. The American people were already exasperated when the United States battleship "Maine" blew up in the harbor of Havana. This was not the cause of war, but undoubtedly hastened American intervention. Congress voted war measures and war taxes by immense majorities. Hostilities began at Manila, in the Philippine Islands, where a Spanish fleet was destroyed on May 1, 1898, by Admiral Dewey. American forces by land and sea held the Spanish in check at Santiago de Cuba. On July 3, in attempting to escape, the Spanish fleet was utterly destroyed.

Peace negotiations were soon opened, and by the treaty of Paris, December 10, 1898, the island of Porto Rico was ceded outright to the United States, and the Philippine Islands on a payment of \$20,000,000. A Cuban republic was established under a protectorate of the United States. In the meantime, on request of the principal inhabitants, Hawaii was annexed.

President McKinley was inaugurated for the second term March 4, 1901, and died of pneumonia on September 6, following, and died September 14th, of the same year. He was succeeded by Vice-President Roosevelt, who, after the election of 1904, was inaugurated March 5, 1905, for a full term.

President Roosevelt at once set about initiating needed reforms in railroad, corporation, and trust methods, and in pushing forward the construction of the Panama canal. In 1906, a race war occurred at Brownsville, Texas, resulting in the colored troops stationed there being ordered out of the state, and in their subsequent expulsion from the United States army by order of the President. In March, 1907, the president issued orders for the dismissal of suits against the San Francisco school board. This action opened the way for negotiations between the govern-

ments of Japan and the United States, which culminated, early in 1908, in the complete restraint of Japanese immigration to the United States.

On March 4, 1909, William H. Taft became president of the United States, and James S. Sherman vice-president. His policy has been one of attempted compromise between the progressive and conservative wings of the party. His adhesion to the Payne-Aldrich tariff law of 1909 led to disastrous political results in the elections of 1910, and a serious conflict in his own party in 1911.

**References.**—Adams's *History of the United States*; Bryce's *The American Commonwealth*; Channing's *A History of the United States*; Harper's *Cyclopedia of United States History*; Hart's *The American Nation and Actual Government*; Johnson's *History of American Politics*; McMaster's *History of the People of the United States*; Rhodes's *History of the United States*; Scudder's *American Commonwealth*; E. E. Spaul's *The United States of America: Wilson's Narrative and Critical History of America*; Wilson's *A History of the American People*; Coolidge's *Constitutional Law in the United States*; Gannett's *North America*; Shaler's *Nature and Man in America*; Dawson's *North America*; Hays's *History of the United States*; Sargent's *Sites of North America*; Hornaday's *American Natural History*; Baird's *Birds*; Ridgway's *Illustrated American Birds*; Jordan and Evermann's *Fishes of North and Middle America*; Dana's *Manual of Geology*; Tarr's *Economic Geology of the United States*; Brunken's *North American Forests and Forestry*; Wright's *Industrial Evolution of the United States*; Mansueti's *Manual of the History of the United States*; Ringwalt's *Development of Transportation Systems in the United States*; Dewey's *History of the United States*; Giddings' *Democracy and Empire*; Nelson's *Army of the United States*; Long's *New American Navy*; Gannett's *History of Education*; Butler's *Education in the United States*; Foster's *American Diplomacy*; Wendell's *Literary History of America*; *Uruguay*, or *Republics Oriental del Uruguay*, a state of South America, was originally occupied by Spaniards, who founded a permanent colony in 1624 on the banks of the Rio Negro, Santo Domingo de Guzman. Portuguese and Dutch colonists from Brazil gradually established trading posts which brought them into close contact with the Spaniards, until in 1723 the latter usurped the heights on the Bay of Montevideo, from which the Portuguese were dislodged. Contests for supremacy ended in favor of the Spaniards. A British fleet attacked and captured Montevideo in 1807, but the failure of an attack on Buenos Ayres caused it to withdraw. In 1810 the people revolted against Spain, and in 1814 the Spanish forces were compelled to evacuate Montevideo. War with the Brazilians followed, and Uruguay was annexed to Brazil; but in 1825 a revolt was organized and in 1828 the independence of Uruguay was recognized. After a few years of peace civil war began, and continued until quiet was restored by the interference of Brazil in 1864. Uruguay then became an ally of Brazil and Argentina against Paraguay, and the resulting war lasted until 1870. From that year until 1903 the history of the republic was comparatively uneventful. In 1900, practically the entire railway system passed into British control.

**References.**—Uruguay, Bureau of American

Republics; Mulhall's *Handbook of the River Plate*; Keane's *Central and South America*; Martin's *Through the Andes*; Vincent's *Round and about South America*.

**Venezuela**, United States of, a republic of South America, on the Caribbean Sea, was discovered by Columbus in 1498; Ojeda and Vespucci followed in 1499, and entering Lake Maracaibo, they found an Indian village constructed on piles, to prevent the ill effects of inundation, and so called it, naming the place Venezuela, or Little Venice, a name which afterward spread to the whole country. The first settlement was made at Cumana in 1520 by the Spaniards; and it remained the capital of the colony until it asserted its independence in 1811, which was followed by a war of nearly eleven years' duration.

In 1813, it formed with New Granada and Ecuador what was called the republic of Colombia. The battle of Carabobo, fought June 24, 1821, destroyed the Spanish yoke and established the new republic. In 1830, on the dissolution of the confederation, Venezuela became an individual republic. The subsequent history of Venezuela was marked by a long period of civil wars, extending from 1847 to 1870, when Guzman Blanco became dictator and then president, holding the reins of power until 1890, when discord again broke out.

The next most important event in the history of Venezuela was its determined opposition to the alleged encroachments of Great Britain on its territory, through an extension of British Guiana, the inducement being, apparently, the discovery of a rich gold field near the border. The dispute, through the intervention of the United States, was submitted to arbitration.

The government of the republic, having been temporarily released from foreign interference, was soon confronted by insurrections, one of which, led by General Castro, was successful. In 1901 he was made president, but was compelled to resign, and several attempts to displace him. In October, 1902, the last of the insurrections was put down. Soon afterward the claims of France, Great Britain, Germany, and Italy, based chiefly on loans for public works and the demands of foreign property owners for compensation for losses, were urgently presented to the government. The French claims afterward were settled, but those of Germany, Spain, and Italy, having failed to collect the amounts demanded, joined in a blockade of Venezuelan ports and hostilities were begun. President Castro requested the United States minister at Caracas, Herbert W. Bowen, to arrange with the blockading powers for a final settlement of their claims. The question arose as to whether the blockading powers should be preferred in payment to those who had not made any hostile demonstration. Near the close of 1902 the matter was referred to the Hague tribunal, which decided in favor of the blockading powers. A new constitution was adopted in 1909.

**References.**—W. L. Scruggs's *The Colombian and Venezuelan Republics*; Spence's *The Land of Bolivar*; Cullen's *Venezuela*; *Venezuela*, Cleveland's *Presidential Profiles*.

### NOTABLE WARS OF HISTORY

The figures prefixed to the name of leaders and battles, etc., indicate to which of the two contending parties the leader belonged, or by which the victory was won; they correspond to the numbers used in the column giving the names of the contending parties. Battles given in *italics* were naval battles. Fuller details of the more important battles will be found in the table of Universal Battles given on page 147.

NAME OF WAR, CONTENTANTS AND DATES	CAUSE OF CONFLICT	LEADERS	CHIEF BATTLES AND INCIDENTS	RESULTS AND COMMENTS
<b>1. TROJAN WAR.</b> (Mythical) 1200 B.C. (1) Greeks vs. (2) Trojans.	Greeks avenge the abduction of Helen of Troy by Paris.	(1) Agamemnon. Achilles, Ulysses. (2) Hector.	(1) <i>Siege of Troy.</i>	Capture and destruction of Troy. Schliemann's excavation identifies Ilium on the Hellespont as the site of ancient Troy.
<b>2. FIRST MESSENIAN WAR.</b> —8th Century B.C. (1) Spartans vs. (2) Messenians.	Spartans covet Messenian land.	(2) Aristodemus.	(1) <i>Siege of Mount Ithome.</i>	Messenians become tributary of Sparta and their land is in part confiscated.
<b>3. SECOND MESSENIAN WAR.</b> —c. 630-600 B.C. (1) Spartans vs. (2) Messenians.	Spartan oppression causes Messenian revolt.	(1) Tyrtæus (poet). (2) Aristomenes.	(1) Elira.	Greater part of Messenians flee to Sicily. Those remaining become Helots (Spartan serfs).



### NOTABLE WARS OF HISTORY—Continued

NAMES OF WAR, CONTRASTANTS AND DATES	CAUSE OF CONFLICT	LEADERS	CHIEF BATTLES AND INCIDENTS	RESULTS AND COMMENTS
<b>4. FIRST SACRED WAR—</b> c.590-569 B.C. (1) Amphictyonic League vs. (2) Crotona.	People of the city of Croia (port of Delphi) oppress pilgrims to the oracle.	(1) Cleisthenes of Sicyon.	(1) Siege of Croia.	For the first time Greek cities join in an effective league. Croia destroyed.
<b>5. PERSIAN WARS—</b> 500-479 B.C. (1) Persians vs. (2) Greeks. a. First Persian Expedition—493 B.C. b. Second Persian Expedition—480-479 B.C. c. Third Persian Expedition—481-480 B.C. d. Fourth Persian Expedition—479 B.C.	Aid given by Athens and Eretria to revolting Ionian Greek cities, leading to burning of Sardis, C. 495. Continued plans of Darius for subjugating Greece.  Xerxes desires to avenge his father's defeat.  War continued by troops which Xerxes left behind.	(1) Mardonius.  (1) Datis, Artaphernes. (2) Miltiades. (3) Xerxes. (2) Leonidas, Eurybiades, Themistocles. (2) Pausanias, Aristides.	(1) 300 ships lost by storm off Mt. Athos.  (1) Naos, Eretria. (2) Marathon (490). (1) Thermopylae, Artemisium, Athens burned. (2) Salamis, sea battle. (2) Plataea, Myrae.	Partial success against Macedonians and Thracians.  The Athenians are victorious and the Persians retreat to Asia Minor. Xerxes retreats to Persia after his defeat at Salamis. All Persian invasions and attempts to subjugate Greece cease.
<b>6. THIRD MESSENIAN WAR—</b> 464-456 B.C. (1) Helots of Messenian descent vs. (2) Spartans.	Confusion following earthquake gives Helots courage to revolt.		(2) Mt. Ithome besieged. Spartans sent home for Athenian allies.	Messenians capitulate and are allowed to leave the Peloponnese never to return. Athens retains by settling them at Naupactus.
<b>7. PELOPONNESIAN WAR—</b> 431-404 B.C. (1) Sparta and Allies vs. (2) Athens and Allies. a. First Period—431-421 B.C. b. Second Period or Decelean War—413-404 B.C.	Envy of Sparta and her allies at Athens' growing power and influence. Discontent among some of the Athenian subject states.  Sparta takes advantage of Athens' weakness, resulting from the failure of the expedition to Syracuse, to renew the war.	(1) Archidamus, Agis, Brasidas. (2) Demosthenes, Cleon, Nicias.  Alcibiades serves Athens, Sparta and Athens in turn. (1) Lyander. (2) Conon.  (1) M. Menellus, Capitolinus, Camillus.	(1) Invasion of Attica, Plague in Siege of Plataea, Deilium, Amphipolis. (2) Peloponnesus, Sicily. (1) Decelia occupied, Attica ravaged. Many subject states of Athens revolt. Nicias, Epistolaus, Sarrander of Athens. (2) Abydos, Cyrcus, Arginon. (1) Battle of the Allia, Sack of Rome.	By the peace of Nicias (421) both sides are to restore conquests and prisoners but terms are imperfectly carried out.  The Spartans tear down the walls of Piræus and Athens. Athens loses her foreign possessions and fleet but becomes an independent ally of Sparta. Sparta is now supreme in Greece.
<b>8. GAULS' INVASION OF ITALY—</b> 390 B.C. (1) Gauls vs. (2) Romans.	Roman people refuse to surrender Roman ambassadors who had sided the Etruscans against the Gauls.			Gauls retire on payment of ransom. The overthrow of Rome had no permanent effect on her fortunes.
<b>9. SECOND SACRED WAR—</b> 357-346 B.C. (1) Phocians vs. (2) Amphictyons.	Phocians seize and plunder Delphi because of fine imposed by Amphictyonic Council.	(1) Onomarchus. (2) Philip of Macedonia.		Thesbans and Thessalians invite aid of Philip against Phocians and so takes their place in the Amphictyonic Council.
<b>10. THIRD SACRED WAR—</b> 335-335 B.C. (1) Macedonians vs. (2) Athenians, Thebans.	Amphictyons call in Philip to punish Amphians, whereupon he seizes Elateia, thereby threatening Athens. Athenians aroused by Demosthenes.	(1) Philip of Macedonia.	(1) Cheronnea.	Philip gains leadership of Greece. Hellenisth Greece is under the control of Macedonia.
<b>11. SAMNITE WARS—</b> 343-290 B.C. (1) Romans vs. (2) Samnites. a. First Samnite War—343-341 B.C. b. Second or Great Samnite War—327-304 B.C. c. Third Samnite War—298-290 B.C.	A dual between two rival races for supremacy in Italy. Campanians implore aid of Romans against Samnites who are laying waste their territories in revenge for aid given the Salerni of Tarentum. The occupation of Palearopolis by the Samnites. In all the Italian cities joined in the war against Rome. While Romans are engaged with the Gauls the Samnites enter Lucania and refuse to withdraw.	(1) Marcus Valerius Corvus, P. Decius Mus (son). (1) Papirius Cursor. (2) Fabius Italianus, Gavius Pontius. (1) Q. Fabius Rullianus, P. Decius Mus (son). (2) Gellius Egnatius, Cereus Pontius. (1) Alexander the Great, Nearchus. (2) Darius III., Memnon.		Capua is retained by the Romans and Tarentum surrendered to Samnites.
<b>12. WARS OF ALEXANDER THE GREAT IN ASIA—</b> 334-323 B.C. (1) Greeks vs. (2) Persians, Egyptians, Bactrians, Indians.	A war of conquest, a scientific expedition and a journey of discovery.		(1) Alexander the Great, Nearchus. (2) Darius III., Memnon.	Alexander conquers Asia from the Mediterranean Sea to the Indus R. and from the Arabian Sea to the Jaxartes R. and begins the Hellenization of the East. Founda Alexandria in Egypt. The empire breaks up after Alexander's death 323.
<b>13. ROMAN WAR WITH TARENTUM AND EPIRUS—</b> 282-272 B.C. (1) Romans vs. (2) Tarentum and King Pyrrhus.	The people of Tarentum capture Roman ships and insult Roman embassy. They call in King Pyrrhus of Epirus.	(1) Manius Curius Pyrrhus.	(1) Beneventum, Tarentum. (2) Heraclea, Asculum.	Pyrrhus returns to Epirus and his allies one by one submit to Rome, which is left supreme from Straits of Messina to the River Arno and the headland of Ancona.
<b>14. FIRST PUNIC WAR—</b> 264-241 B.C. (1) Romans vs. (2) Carthaginians.	A struggle for supremacy in Sicily. Pretax, Campanian mercenaries, having seized Mesina, appeal to Rome for aid.	(1) C. Duilius M. Atilius Regulus, P. Claudius Pulcher, C. Lutatius Catulus. (2) Hamilcar Barca, Himilco, Hanno.	(1) Agrigentum, Mylae, Enomum, Paenorum, Egadine Islands. (2) Siege of Lilybaeum, Drepana.	Carthaginians surrender Sicily and pay a war indemnity. Carthage retains the Western Mediterranean and Rome is launched on her career of conquest.
<b>15. SECOND PUNIC WAR—</b> 218-201 B.C. (1) Romans vs. (2) Carthaginians.	A duel to the death between Hannibal's attacks on Saguntum in Spain.	(1) Q. Fabius Maximus Velleus, Publius Scipio, P. Cornelius Scipio Africanus, Hannibal. (2) T. Quinctius Flamininus, L. Sempronius Paulus. (2) Philip of Macedonia.	(1) Syracuse, Capua, Metaurus, Zama. (2) Trebia, Trasimene, Cannae.	Hannibal succumbs as a result of the battle of Zama. Carthage forced to give up Spain, to pay an annual tribute, to surrender her fleet, and to agree not to go to war without the permission of Rome.
<b>16. FOUR MACEDONIAN WARS—</b> 214-146 B.C. (1) Romans vs. (2) Greeks.	Alliance of Philip, King of Macedonia, with Carthage.		(1) Cynoscephalae, Pydna.	Macedonia becomes a Roman province.

## NOTABLE WARS OF HISTORY—Continued

NAME OF WAR, CONTENDERS AND DATES	CAUSE OF CONFLICT	LEADERS	CHIEF BATTLES AND INCIDENTS	RESULTS AND COMMENTS
<b>17. THIRD PUNIC WAR—</b> 149-146 B.C. (1) Romans vs. (2) Carthaginians.	War of Carthage with Massinissa gives Rome the pretext for completing the destruction of Carthage.	(1) Scipio Aemilianus Africanus.	(1) Siege of Carthage.	Carthage destroyed. Most of her territory becomes a Roman province of Africa.
<b>18. JUGURTHINE WAR—</b> 111-105 B.C. (1) Romans vs. (2) Jugurtha of Numidia.	Jugurtha, disregarding intervention of Rome, captures Citra and massacres male population.	(1) C. Marius. (2) Jugurtha.	(1) Muthul, Citra.	Numidia divided. The war reveals the corruption and incapacity of the Senatorial government of Rome.
<b>19. MARSIAN OR SOCIAL WAR—90-88 B.C.</b> (1) Roman vs. (2) Italian Allies.	Italian soil (allies) are denied the right of Roman citizenship.	(1) C. Marius. Sulla.	(1) Asculum. Italians form a Federal republic, Italia, with capital at Corfinium.	Roman citizenship granted to all Italian residents.
<b>20. FIRST ROMAN CIVIL WAR—88-82 B.C.</b> (1) Optimates vs. (2) Democrats.	Reform measures of Sulpicius are carried by means of violence. Command of army of Asia is transferred from Sulla to Marius.	(1) Sulla, Pompey. (2) Marius, Cinna, Sertorius, Carbo.	(1) Sacriportus, Colline Gate, Sulla's proscription. (2) Marius's Reign of Terror.	Sulla is appointed dictator.
<b>21. THREE MITHRIDATIC WARS—88-63 B.C.</b> (1) Roman vs. (2) Pontians and Armenians.	Ambition of Mithridates VI. and Roman interference.	(1) Sulla, Lucius Pompey. (2) Mithridates (Pontus). Tigranus (Armenia). (3) Crassus, Pompey. (2) Spartacus.	(1) Cheronnea, Orchomenus, Gabra, Tigranocerta. (2) Massacre of Italians in Asia. (3) Siliurus. (2) Mt. Vesuvius.	Reorganization of the East. Pontus, Syria and Cilicia become Roman provinces. Revolt put down with cruelty, 6,000 crucified.
<b>22. GLADIATORIAL AND THIRD SERVILE WAR—73-71 B.C.</b> (1) Roman vs. (2) Sailed Gladiators and Slaves.	Uprising of a band of gladiators, escaped from Capua and joined by many slaves of southern Italy.	(1) Julius Caesar. (2) Verres, Cicerus, Ariovistus.	(1) Siege of Alesia.	Conquest and organization of Gaul by Caesar. Gauls Romanized; boundaries of the old world enlarged (Caesar's expedition to Britain 55-54 B. C.); means acquired for changing Rome into a monarchy. Caesar is appointed dictator for life. He is the founder of the new monarchy at Rome.
<b>23. GALIC WAR—55-51 B.C.</b> (1) Roman vs. (2) Tribes of Gaul.	Desire to extend the Roman empire.	(1) Caesar. (2) Pompey and his sons.	(1) "Crossing the Rubicon." Pharsalus, Thapsus, Munda.	Brutus and Cassius, defeated, commit suicide.
<b>24. SECOND ROMAN CIVIL WAR—49-31 B.C.</b> First period, 49-48 B.C. (1) Followers of Caesar (democrats) vs. (2) Followers of Pompey (republican aristocrats). Second period, 43-42 B.C. (1) Friends of Caesar (Second Triumvirate) vs. (2) Caesar's Assassins. Third period, 31-30 B.C. (1) Octavius vs. (2) Antony.	Struggle for mastery between Caesar, conqueror of Gaul, and Pompey, conqueror of the East. Assassination of Caesar, 44 B. C. A continued struggle for supreme power.	(1) Antony, Octavius, Lepidus. (2) Brutus, Cassius, Scato Pompey. (1) Octavius. (2) Antony, Cleopatra. (1) Titus, son of Emperor Vespasian.	(1) New proscription (Mark of Cicero). Philippi. (1) Actium.	Triumph of Octavius, grand nephew of Julius Caesar. End of the republic and beginning of the empire.
<b>25. JEWISH WAR—</b> A. D. 66-70. (1) Romans vs. (2) Jews.	Revolt of the Jews against Rome.	(1) Domitian, Trajan. (2) Decebalus.	(1) Siege of Jerusalem.	Destruction of Jerusalem and the temple.
<b>26. DACIAN WARS—86-90, 101-102, 105-107.</b> (1) Roman vs. (2) Dacians.	Rome desires to extend her conquests.	(1) Constantine. (2) Maximus, Maximinus, Licinius.	(1) Turin.	Dacia is made a Roman province. Roman conquest and empire reaches its highest point.
<b>27. CIVIL WARS OF THE ROMAN EMPIRE—193-284.</b>	Contests for the throne among rival generals (barrack emperors).	(1) Constantine. (2) Others: Augusti.	(1) Battle near Chalons (451). (2) Adrianople, Sack of Rome. Visigothic Kingdom of Tolosa (Toulouse), (415-507). Vandals settle in Africa (429-534). Carthage, (439). Burgundians occupy Rhone Valley (443). Angles, Saxons and Jutes invade England (449). Huns and Ostrogoths ravage Gaul. Huns destroy Aquilles and Venice founded (452). Vandals plunder Rome (455). Odoacer gains ascendancy in Rome. The fall of the Roman empire (476). Ostrogothic kingdom in Italy (493-555).	Reorganization of empire by Diocletian (284-305).
<b>28. WARS OF CONSTANTINE THE GREAT FOR THE EMPIRE—310-323.</b> (1) Constantine vs. (2) Others: Augusti.	Confusion following abdication of Diocletian.	(1) Constantine. (2) Others: Augusti.	(1) Battle near Chalons (451). (2) Adrianople, Sack of Rome. Visigothic Kingdom of Tolosa (Toulouse), (415-507). Vandals settle in Africa (429-534). Carthage, (439). Burgundians occupy Rhone Valley (443). Angles, Saxons and Jutes invade England (449). Huns and Ostrogoths ravage Gaul. Huns destroy Aquilles and Venice founded (452). Vandals plunder Rome (455). Odoacer gains ascendancy in Rome. The fall of the Roman empire (476). Ostrogothic kingdom in Italy (493-555).	Constantine becomes sole ruler of Roman empire. He redistricts the empire, moves the capital to Constantinople and recognizes Christianity.
<b>29. INVASION OF ROMAN EMPIRE BY NORTHERN BARBARIANS—375-493.</b> (1) Roman vs. (2) Teutonic and Hunic Teutonic Tribes; Visigoths, Vandals, Suevi, Franks, Burgundians, Ostrogoths, Alemanni, Jutes, Saxons, Angles, Lombards.	The Huns (Mongolians) press upon the Teutons, who are forced to seek new lands within the boundaries of the Roman empire.	(1) Valens, Stilicho Aetius, Leo (bishop of Rome) (2) Alaric, Wala (Visigoth); Genseric (Vandal); Hengist and Horsa (Saxons); Attila (Hun); Theodore the Great (Ostrogoth).	(1) Battle of Chalons (451). (2) Adrianople, Sack of Rome. Visigothic Kingdom of Tolosa (Toulouse), (415-507). Vandals settle in Africa (429-534). Carthage, (439). Burgundians occupy Rhone Valley (443). Angles, Saxons and Jutes invade England (449). Huns and Ostrogoths ravage Gaul. Huns destroy Aquilles and Venice founded (452). Vandals plunder Rome (455). Odoacer gains ascendancy in Rome. The fall of the Roman empire (476). Ostrogothic kingdom in Italy (493-555).	Overthrow of the Roman empire in the west, though it continued in the east until 1453. The blending of Roman and Teutonic elements under the influence of the Christian religion and what remained of classic civilization formed the civilisation of the middle ages.
<b>30. WARS OF JUSTINIAN.</b> (1) Eastern Empire vs.— 333-554. (2) Vandals in Africa and (3) Ostrogoths in Italy— 533-555.	Desire to restore west to eastern empire.	(1) Belisarius, Narces. (2) Vitiges, Totila.	(1) Battle of Taginae (552).	Destruction of Vandal power in Africa and of the Ostrogothic kingdom in Italy. Eusebius established at Ravenna.

## NOTABLE WARS OF HISTORY—Continued

NAME OF WAR, CONTENDANTS AND DATES	CAUSE OF CONFLICT	LEADERS	CHIEF BATTLES AND INCIDENTS	RESULTS AND COMMENTS
<b>31. WARS OF THE FRANKS—486-514.</b> (1) Franks vs. (2) Neighboring Peoples.	Desire to extend the limits of Frankish territory and to ward off attacks from without.	(1) <b>Clotis (486-511), Charibert Marlot (514-515), Pepin the Short (751-768), Charlemagne (768-814).</b>	(1) <b>Solssons (486), Clotis conquers Alsace and becomes a Catholic (Christian (496), Battle of Tours (732), Conquest of Burgundy (534), Charlemagne conquers Lombards (774-778), Saxons (775-804), Bavarians (788), Avars (791), Northern Spain (795).</b>	Franks become leading power in the west and revive the western empire. (Christmas day, 800, Milton.)
<b>32. HEPTARCHIC WARS IN ENGLAND—588-828.</b>	Struggle for supremacy among the seven Teutonic kingdoms.	Elthelbert (Kent), Edwin (Northumbria), Offa (Mercia), Egbert (Wessex).	The supremacy was successively held by kings of Kent, Northumbria, Mercia, and Wessex. Naerfield (842), Ellandun (825).	"The indistinct noise of many battles and devastations of many kingdoms overrun and lost." (Milton.) All England at last united under Egbert, king of Wessex (802-837).
<b>33. NORTHMEN INVASIONS—ninth and tenth Centuries.</b> (1) Northmen vs. (2) People of Western and Southern Europe.	Opportunity for plunder and conquest and later the driving out of adventurous spirits by the organization of settled kingdoms in the north.	(1) <b>Hastings, Rolf, Sweyn, Canute.</b> (2) <b>Alfred (England), Otto (France).</b>	<i>In England.</i> Treaty of Wedmore. Massacre of Danes, (1002). <i>In France.</i> (2) Siege of Paris. Grant of Normandy to Rolf (977).	The Northmen are the last swarm of Teutonic conquerors. They readily assimilate civilization and infuse new energy into western Europe.
<b>34. SARACEN OR MOHAMMEDAN WARS—632-1492.</b>	Saracens are ambitious to found a world wide Mohammedan empire.	(1) <b>Omar, Amru, Hassan, Moza, Tarik, Abderrahman, Mohammed II, Abdallah.</b> (2) <b>Yasgerud (Persia), Leo the Isaurian, Charles Martel, Constantine, Paleologus, Ferdinand of Aragon.</b>	(1) <b>Yarmouk (Syria), Bosra, Jerusalem, Caesarea (Persia), Alexandria (Carthage), Xerex (Spain), Granada, Toledo.</b> (2) <b>Constantinople (710), Tours, Jerusalem, Las Navas de Tolosa (1212).</b> (3) <b>Constantinople (1453).</b> (2) <b>Granada (1492).</b>	The Saracens attempted to conquer and convert Europe at three different times between 710 and 1492. Their power began to wane from the latter date.
<b>35. NORMAN CONQUEST—1066.</b> (1) Normans vs. (2) English.	William, duke of Normandy wishes to increase his territory and his power.	(1) <b>William the Conqueror.</b> (2) <b>Harold, king of England.</b>	(1) <b>Hastings.</b>	The king received added power and a modified feudalism introduced into England. Southern Italy and Sicily were also conquered by bands of Normans in the eleventh century and the kingdom of Naples founded.
<b>36. CRUSADES—1096-1270.</b> (1) European Christians vs. (2) Turks and Moslems. First Crusade—1096-1099.  Second Crusade—1147-1149.  Third Crusade—1189-1192.  Fourth Crusade—1201-1204. (1) Crusaders vs. (2) Eastern Empire.  Children's Crusade (legendary)—1212.  Fifth Crusade—1228-1229.  Sixth Crusade—1248-1254.  Last, Seventh Crusade—1270-1291.	The appeal of the eastern emperor for aid, the desire to recover the Holy Sepulcher from the infidels, the love of adventure, and hope of gain.  The Conquest of Edessa by the Moslems threatens Jerusalem. Preaching of Saint Bernard. Capture of Jerusalem by Saladin.  Appeals of Innocent III. Through influence of the Venetians the Crusaders turn aside to attack Constantinople.  Ignorant enthusiasm aroused by visions and miraculous tales.  Vow of Frederick II. of Germany. He goes under pope's excommunication.  Louis IX. of France starts on a crusade via Egypt.  Louis IX. goes against Mohammedans of Tunis, Prince Edward of England to Syria.	(1) <b>Peter the Hermit, Geoffrey of Bouillon, Bohemond of Tarantum, Robert of Normandy.</b> (2) <b>Conrad III. of Germany, Louis VII. of France.</b> (3) <b>Richard I. of England, Philip Augustus of France, Frederick Barbarossa of Germany.</b> (2) <b>Saladin.</b> (1) <b>Dandolo, Doge of Venice, Baldwin of Flanders.</b>  A shepherd lad, Stephen of Vendome.  (1) <b>Frederick II.</b>  (1) <b>Louis IX., later St. Louis.</b> (1) <b>Louis IX., Prince Edward.</b>	(1) <b>Nicaea, Antioch, Jerusalem.</b>  Unsuccessful attack on Damascus.  (1) <b>Acre.</b>  (1) <b>Sack of Constantinople.</b>  Thousands of children, women and peasants march from France and Germany to the Mediterranean.  (1) <b>Damietta.</b> (2) <b>Expedition to Cairo.</b>  Death of Louis by the plague. (2) <b>Acre, last Christian stronghold in Syria, falls (1291).</b>  (1) <b>Milan (1167).</b> (2) <b>Legnano (1176).</b>	Jerusalem is subdued and a transjordanic Jerusalem is founded at Jerusalem.  Armies almost annihilated by hunger, disease and the enemy.  The Latin Christians secure by treaty the privilege of visiting the tomb of Christ for three years without molestation.  Division of eastern empire. The Venetians get the monopoly of trade and most of the islands and coast lands of the Aegean and Ionian seas. The remainder is erected into a feudal state, the Latin empire.  Only a small number return home; the others perish on the way or are sold into slavery by French merchants.  Frederick, by treaty with the sultan, secures a truce for ten years and the restoration of Bethlehem, Nazareth and Jerusalem to the Christians. Jerusalem is finally lost in 1244.  Louis is captured in battle and released on payment of heavy ransom and evacuation of Damietta. The results of the crusades were development of commerce, introduction of new customs, products and manufactures, increase in freedom of lower classes, especially townsmen, and the power of the crown.  By treaty of Constance (1183) the cities of Lombardy are recognised as practically self-governing republics, the barest overlordship remaining to the emperor.  The beginning of constitutional monarchy—henceforth the king is below the law, not above it.
<b>37. WAR OF THE EMPIRE vs. (2) Italian Communes—1158-1183.</b>	Frederick Barbarossa's attempt to restore imperial rights over the cities of Northern Italy.	(1) <b>Frederick I. Barbarossa.</b> (2) <b>Pope Alexander III.</b>	(1) <b>Milan (1167).</b> (2) <b>Legnano (1176).</b>	
<b>38. WARS OF THE BARONS IN ENGLAND—1215-1265.</b> (1) Barons vs. (2) Kings John and Henry III.	Misgovernment of John and Henry III.	(1) <b>Stephen Langton, Simon de Montfort.</b> (2) <b>King John, Prince Edward, later Edward I.</b>	(1) <b>Signing of Magna Charta.</b> (2) <b>Simon de Montfort's Parliament.</b> (2) <b>Everham.</b>	

## NOTABLE WARS OF HISTORY—Continued

NAME OF WAR, CONTENDERS AND DATES	CAUSE OF CONFLICT	LEADERS	CHIEF BATTLES AND INCIDENTS	RESULTS AND COMMENTS
<b>39. HUNDRED YEARS' WAR</b> 1337-1453. (1) English vs. (2) French.	The conflict of interests of the French and English kings in Guenney, Flanders and Scotland. Edward III. advances claim by descent to the throne of France.	(1) Edward III. Edward the Black Prince, Prince Henry V. Duke of Bedford. (2) Du Guesclin, Charles V., Joan of Arc. (3) Leopold III. of Austria. (4) Arnold von Winkelried.	(1) Crécy, Calais, Poitiers, Peace of Brétigny, Agincourt. Treaty of Troyes. (2) Orléans (1429), Castillon (1453).	England loses all her land in France except Calais. During the earlier stage of this war about one-third of the population of western Europe perished from the Black Death.
<b>40. AUSTRO-SWISS WAR</b> —1315-1358. (1) House of Hapsburg vs. (2) Swiss Confederation.	Hapsburg assert feudal rights over the peasants of the Swiss cantons.	(1) Leopold III. of Austria. (2) Arnold von Winkelried.	(2) Morgarten, Sempach, Näfels.	Independence of Swiss secured.
<b>41. HUSSITE WAR</b> —1419-1436. (1) Bohemian followers of John Hus vs. (2) Catholic Europe.	Execution of John Hus, the Bohemian religious reformer by the council of Constance.	(1) Ziska, Procopius the Great. (2) Emperor Sigismund, Cardinal Cossat, Frederick of Brandenburg.	Revolt of Prague. Four crusades repulsed.	After the overthrow of the radical Hussites (Tabornites) by the conservative Hussites (Calistines) in the battle of Lipan a Catholic reaction set in which culminated in 1462 with the revocation of the compacts made by the Council of Basel with the Hussites.
<b>42. WARS OF THE ROSES</b> —1455-1485. (1) Yorkists (White Rose) vs. (2) Lancastrians (Red Rose).	Misgovernment under Henry VI. encourages Richard, duke of York, representing the second line of descent from Edward III., to claim the throne against Henry VII. (third line).	(1) Richard, duke of York, Edward IV. Richard III. (2) Duke of Somerset, Queen Margaret, Earl of Warwick ("King-maker"), first a Yorkist and then a Lancastrian. Henry VII.	(1) St. Albans, Northampton, Mortimer's Cross, Tewkesbury, Barnet, Tewkesbury. (2) Wakefield, Bosworth Field.	Henry Tudor (Lancastrian in the female line) secures throne as Henry VII. By his marriage with Elizabeth of York he unites the warring factions and establishes an almost despotic rule in England.
<b>43. WARS FOR CONTROL OF ITALY</b> —1494-1529. (1) French vs. (2) Spanish.	Conflicting claims to the throne of Naples and to the duchy of Milan.	(1) Charles VIII., Louis XII., Ferdinand I. ("Chevalier sans peur et sans reproche"), Francis I. (2) Ferdinand of Aragon, Charles V., duke of Bourbon, France. (3) Emperor Charles V., Duke Maurice of Saxony. (4) John Frederic, Elector of Saxony; Philip, Landgrave of Hesse.	Invasion of Italy by Charles VIII. (1494). League of Cambray (1508). Holy League (1511). (1) Marignano. (2) Pavia.	All the leading powers of western Europe were drawn into this struggle. By the peace of Cambray (1559) France renounced her claims to Italy. One effect of these wars was to tie the hands of Charles V., so as to prevent his putting down Lutheranism in Germany.
<b>44. SCHMALKALDIC WAR</b> —1546-1547. (1) Charles V. vs. (2) League of Schmalkalden.	Charles V. attempts to crush Protestantism in Germany.	(1) Emperor Charles V., Duke Maurice of Saxony. (2) John Frederic, Elector of Saxony; Philip, Landgrave of Hesse.	(1) Mühldorf. (2) Mecklin, Haarlem.	Protestantism temporarily crushed. Its recovery in 1555 was followed by the religious peace of Augsburg 1555.
<b>45. RELIGIOUS WARS IN FRANCE</b> —1562-1598. (1) Catholics vs. (2) Huguenots (Protestants).	Mansuete of Huguenots at Vassy is a signal for uprising.	(1) Duke of Guise, Henry III. (2) Catherine de Medici, Condé, Coligny, Henry of Navarre (Henry IV.).	(1) Massacre of St. Bartholomew (1572). (2) Siege of Paris, Ivry (1590). Henry of Navarre becomes a Catholic (1593). Riots of Image Breakers, Council of Blood. (1) Mechlin, Haarlem. (2) Brill, Siege of Leyden, "Spanish Fury" at Antwerp. Pacification of Ghent (1576). Union of Utrecht (1579). Declaration of Independence (1581). (1) Stralsund, Edict of Restitution, Breitenfeld, Lützen. (2) White Hill, Magdeburg, Nordlingen.	By the edict of Nantes (1598) the Huguenots are given equal political rights. By the Peace of Westphalia, 1648, the worship of La Rochelle and other strong places as cities of refuge.
<b>46. WAR OF LIBERATION IN THE NETHERLANDS</b> —1568-1648. (1) Spain vs. (2) Revolted provinces in the Netherlands.	Political and religious tyranny of Spain. Duke of Alva enforces the Inquisition.	(1) Duke of Alva, Alexander of Parma. (2) William of Orange, Jan van Olden, Barneveldt, Maurice of Nassau.	(1) Frederick, Elector Palatine, Mansfeld, Gustavus Adolphus, Sweden, Turenne and Condé (France). (2) Emperor Ferdinand II, Maximilian of Bavaria, Tilly, Wallenstein. (1) Charles I., Prince Rupert, Montrose. (2) Cromwell, Essex, Fairfax, Leslie.	By the Peace of Westphalia (1648) the independence of the seven northern provinces, the United Netherlands, is recognized. The ten southern provinces continue under Spanish rule until 1713.
<b>47. THIRTY YEARS' WAR</b> —1618-1648. (1) German Protestants and their allies, England, Holland, Sweden and France vs. (2) Imperial German Catholics and their allies, Spain, Italy.	Disputes over interpretation of peace of Augsburg (religious and political) disputes leading to the revolt of Bohemia. The war passes through four phases—(1) Bohemian-Palatinates, (2) Danish, (3) Swedish, (4) Swedish-French.	(1) Frederick, Elector Palatine, Mansfeld, Gustavus Adolphus, Sweden, Turenne and Condé (France). (2) Emperor Ferdinand II, Maximilian of Bavaria, Tilly, Wallenstein. (1) Charles I., Prince Rupert, Montrose. (2) Cromwell, Essex, Fairfax, Leslie.	(1) Frederick, Elector Palatine, Mansfeld, Gustavus Adolphus, Sweden, Turenne and Condé (France). (2) Emperor Ferdinand II, Maximilian of Bavaria, Tilly, Wallenstein. (1) Charles I., Prince Rupert, Montrose. (2) Cromwell, Essex, Fairfax, Leslie.	This war is closed by the peace of Westphalia. Since then the independence of the seven northern provinces, the United Netherlands, is recognized. The ten southern provinces continue under Spanish rule until 1713.
<b>48. CIVIL WAR IN ENGLAND</b> —1642-1649. (1) Royalists (Cavaliers) vs. (2) Parliamentarians (Roundheads) allied with Scots (to 1647).	Charles I. attempts to force a personal government on England. His disputes with Parliament covered (1) taxation, (2) privileges of Parliament, (3) religion, (4) control of the militia.	(1) Charles I., Prince Rupert, Montrose. (2) Cromwell, Essex, Fairfax, Leslie.	(1) Marston Moor, Naseby, Preston.	The second civil war (1648) determines the army leaders to bring Charles I. to trial and execution (1649). Commonwealth established without King or House of Lords but with Oliver Cromwell as Protector (1653 to 1659). The son of Charles I. restored in 1660 as Charles II.
<b>49. FIRST THREE WARS OF LOUIS XIV.</b> —1667-1707. (1) France vs. (2) a. Spanish Netherlands. b. Dutch republic. c. Grand Alliance (German states, England, Holland).	Louis XIV.'s passion for fame and desire to increase French territory in Europe.	(1) Turenne, Condé, Luxembourg. (2) William III., De Ruyter.	Chambers of Reunion. (1) Ravaging of Flanders, Steenkerke, Neerwinden. (2) Saabach, La Hogue, Namur.	Extension of boundaries of France to the northeast.
<b>50. SPANISH SUCCESSION</b> in America, QUEEN ANNE'S WAR—1701-1714. (1) France, Spain and Savoy vs. (2) Austria, England, Holland, Portugal, Savoy.	Acceptance by Louis XIV. of the bequest of the Spanish dominion to his grandson, Philip of Anjou. In violation of the partition treaty to which he had consented.	(1) Vendôme, Villars, Leopold of Deaulx. (2) Duke of Marlborough, Eugene of Savoy, Heilsnis.	(1) Gibraltar, Blenheim, Ramillies, Turin, Oudenarde, Malplaquet.	By the peace of Utrecht in 1713 and that of Rastadt in 1714 Spain and the Indies go to Philip of Anjou; Naples, Sicily, Sardinia and other Spanish Netherlands to the Austrians. England receives Newfoundland, Acadia and Hudson Bay Territory from France and Gibraltar from Spain.

## NOTABLE WARS OF HISTORY—Continued

NAME OF WAR, CONTES- TANTS AND DATES	CAUSE OF CONFLICT	LEADERS	CHIEF BATTLES AND INCIDENTS	RESULTS AND COMMENTS
<b>51. NORTHERN WAR—1700-1721</b> (1) Sweden vs. Russia, Poland, Denmark, Saxony.	Peter the Great joins Poland, Denmark and Saxony for the purpose of despoiling Sweden, the first power of the north, of her Baltic ports.	(1) Charles XII. (2) Peter the Great (Russia), Augustus II. of Saxony.	(1) Invasion of Denmark. Narva, invasion of Saxony. (2) Pullava.	By the peace of Nystad (1721) Sweden cedes large territories to Russia. Russia takes the place of Sweden as the foremost power of the north.
<b>52. WAR OF THEAUSTRIAN SUCCESSION—1740-1748.</b> (1) Austria, supported by Hungary, Bohemia, England, Holland and Saxony vs. (2) Prussia, France, Spain, Bavaria.	When Maria Theresa succeeded her father, Charles IV. of Austria, Frederick the Great of Prussia seized Silesia, thus precipitating a struggle for Austrian territories.	(1) Maria Theresa, George II. of England. Charles of Lorraine. (2) Frederick the Great of Prussia, Emperor Charles VI, Schwernin.	(1) Mollwitz, Chotusitz, Prague, Fontenoy, Hohen- neuburg, Soor. Peace of Dresden.	By the treaty of Aix-la-Chapelle Silesia is secured to Prussia, which state now becomes a great European power. This war is one phase of the long rivalry between France and Great Britain for seapower and dominion in America and India.
<b>53. SEVEN YEARS' WAR, OR THIRD SILESIAN WAR: In America, FRENCH AND INDIAN WAR— 1750-1763.</b> (1) England, Prussia vs. France, Austria, Russia, Spain, Sweden.	At the death of Charles VI. of Austria the right of Maria Theresa to the throne is contested chiefly by Frederick the Great of Prussia who seizes Silesia. Maria Theresa wishes to regain Silesia. Hostilities between French and English America and India. George II's concern for his ancestral territory of Hanover.	(1) Frederick the Great, Duke of Cumberland. Wolfe (America). Robert Clive, (India). (2) Daun (Austria). Charles of Lorraine, Montcalm (America).	(1) Dresden, Rossbach, Leuthen, Zorndorf, Minden. Hohen, Hohenkrehen, Kunersdorf. In America: (1) Louisburg, Fort Du quesne, Quebec. In India: (1) Plassey, Wandewash.	The peace of Paris (1763) gives England, Canada, the supremacy in India and certain islands, especially in the West Indies. Prussia retains Silesia. This war really founded the British empire which is based on sea-power and colonial dominion.
<b>54. AMERICAN REVOLU- TIONARY WAR—1775-1783.</b> (1) English Colonies in America aided by France vs. (2) England.	The revolt of the colonies against England was caused by in- fringements upon what they considered their rights of govern- ment, especially local self government and taxation.	See page 135.	See page 135.	Recognition of the independence of the United States in the peace of Paris (1783). The Mississippi river becomes the western bound- ary of the United States.
<b>55. WARS OF THE FRENCH REVOLUTION—1792-1802.</b> (1) Revolutionary France vs. (2) Coalitions of England, Austria, Prussia, Holland, and Spain. The Empire, Russia. a. First Coalition— 1792-1797. b. Bonaparte's Egyptian Expedition—1798-1799.	Intrigues of ambition; horror of Europe at the execution of the king; French offer of aid to revolutionaries in other coun- tries.	(1) Dumouriez, Kellermann, Jourdan, Hoche, Fischberg, Na- poleon Bonaparte, Moreau. (2) Duke of Brunswick, Coburg, Charles of Austria. (1) Napoleon Bonaparte. (2) Nelson (England).	(1) Valmy, Occupation of Nice and Savoy, Jem- mapes, Execution of king (1793), Annexion of Belgium, Fleurus, Lodi, Siege of Mantua. (2) Maitin, Neerwinden, Kaiserslautern, Wurzburg. (1) Battle of the Pyra- mids. (2) Battle of the Nile at Aboukir, Arre. (1) Marengo, Hohenlin- den. Napoleon's passage of the Alps (Great St. Bernard). Novi. (1) Ulm, Austerlitz. (2) Tulaugur.	By peace of Campo Formio (1797) the French frontier is advanced to the Rhine. Venice is given to Austria and the Cisalpine and Ligurian republics founded in Italy under French control.
c. Second Coalition. —1799-1802.	The mistakes of the government of the Directory and the prestige of Nelson's victory enable Great Britain to form the Second Coalition.	(1) Napoleon, Jour- dan, Bernadotte, (2) Suvarov, Melas, Archduke John.	(1) Marengo, Hohenlin- den. Napoleon's passage of the Alps (Great St. Bernard). Novi. (1) Ulm, Austerlitz. (2) Tulaugur.	Nelson's victory removes a serious menace to British power in India, cuts off the French in Egypt and deprives France of communication with its best troops and ablest general.
<b>56. NAPOLEONIC WARS— 1802-1815.</b> (1) France under Napoleon vs. (2) European Powers led by England. a. Third Coalition—1805.  b. (Fourth) War with Prussia and Russia. —1806-1807.	Neither England nor France regarded the peace of Amiens as more than a truce. Among the many causes of friction leading to renewal of war chief place was given to England's refusal to restore Malta.	(1) Napoleon. (2) Nelson, Mack, Alexander I. (Russia), Kutsoff.	(1) Corunna. (2) Talavera, Lines of Torres- Vedras, Albuera, Salamanca, Vittoria, Toulouse. (1) Aspern, Wagram. (1) Corunna. (2) Talavera, Lines of Torres- Vedras, Albuera, Salamanca, Vittoria, Toulouse. (1) Aspern, Wagram. (1) Smolensk, Borodino. Burning of Moscow. Retreat from Moscow. Passage of the Beresina. (1) Lützen, Bautzen, Dresden. (2) Dennewitz, Leipzig. (Battle of the Nations). Allies enter Paris.	The peace of Presburg ends the First Coalition. France and Austria. Much harsher terms are imposed on Austria. Peace of Lunéville with Austria (1801); peace of Amiens with England (1802); surrender of England's conquest except Malta. Ceylon; Malta to be restored to Knights of Malta. As a result of his brilliant successes Napoleon in 1802 becomes consul for life and in 1804 took the title emperor of the French. Confirmation of treaty of Campo Formio, with the recognition of Batavian, Helvetic, Cisalpine and Ligurian republics. By the treaties of Tilsit (1807) Russia recognizes Napoleon's relatives as kings of Naples, Holland and Westphalia and consents to the creation of the Confederation of the Rhine and the grand duchy of Warsaw under Napoleon's con- trol. Alexander and Napoleon combine to dominate Europe. Prussia cedes territories contain- ing half her population. French expelled from the peninsula.
c. Peninsular War— 1808-1814.	Rebellion of Spain against Joseph Bonaparte, whom Na- poleon had placed on the throne.	(1) Soult, Massena, (2) Duke of Wellington.	(1) Corunna. (2) Talavera, Lines of Torres- Vedras, Albuera, Salamanca, Vittoria, Toulouse. (1) Aspern, Wagram. (1) Smolensk, Borodino. Burning of Moscow. Retreat from Moscow. Passage of the Beresina. (1) Lützen, Bautzen, Dresden. (2) Dennewitz, Leipzig. (Battle of the Nations). Allies enter Paris.	Austria cedes 32,000 square miles of territory, containing 2½ million inhabitants. Less than 20,000 of the half million men in Napoleon's army recrossed the Russian frontier.
d. Fifth War with Aus- tria—1809.	Alexander's refusal to enforce Napoleon's continental sys- tem, and other causes of dispute.	(1) Napoleon. (2) Archduke Charles.	(1) Corunna. (2) Talavera, Lines of Torres- Vedras, Albuera, Salamanca, Vittoria, Toulouse. (1) Aspern, Wagram. (1) Smolensk, Borodino. Burning of Moscow. Retreat from Moscow. Passage of the Beresina. (1) Lützen, Bautzen, Dresden. (2) Dennewitz, Leipzig. (Battle of the Nations). Allies enter Paris.	Driven from Russia in 1812, from Prussia in 1813, Napoleon in 1814 was forced to surrender France itself. By the treaty of Fontenoy he was expelled from the island of Elba and an annual renewal of 2,000,000 francs.
e. Invasion of Russia— 1812.	The disastrous Russian cam- paign, together with the steady progress of the British in the peninsula war en- couraged the oppressed states of Germany to rise against Napoleon's tyranny, Prussia taking the lead.	(1) Napoleon, Ney, Marschall Ney, (2) Kutsoff, Barclay de Tolly. (1) Napoleon, Ney, Marschall Ney, (2) Frederick, Wil- liam III, Francis I., Alexander I., Schwarzenberg, Blücher, Bernadotte.	(1) Corunna. (2) Talavera, Lines of Torres- Vedras, Albuera, Salamanca, Vittoria, Toulouse. (1) Aspern, Wagram. (1) Smolensk, Borodino. Burning of Moscow. Retreat from Moscow. Passage of the Beresina. (1) Lützen, Bautzen, Dresden. (2) Dennewitz, Leipzig. (Battle of the Nations). Allies enter Paris.	Wounded in 1812, Napoleon in 1814 was forced to surrender France itself. By the treaty of Fontenoy he was expelled from the island of Elba and an annual renewal of 2,000,000 francs.
f. War of Liberation— 1813-1814.	Quarrels among the allies and disaffection of French with Louis XVIII. tempt Napoleon to return from Elba.	(1) Napoleon, Ney, (2) Wellington, Blücher.	(1) Corunna. (2) Talavera, Lines of Torres- Vedras, Albuera, Salamanca, Vittoria, Toulouse. (1) Aspern, Wagram. (1) Smolensk, Borodino. Burning of Moscow. Retreat from Moscow. Passage of the Beresina. (1) Lützen, Bautzen, Dresden. (2) Dennewitz, Leipzig. (Battle of the Nations). Allies enter Paris.	Wounded in 1812, Napoleon in 1814 was forced to surrender France itself. By the treaty of Fontenoy he was expelled from the island of Elba and an annual renewal of 2,000,000 francs.
g. Waterloo Campaign —1815.	Quarrels among the allies and disaffection of French with Louis XVIII. tempt Napoleon to return from Elba.	(1) Napoleon, Ney, (2) Wellington, Blücher.	(1) Corunna. (2) Talavera, Lines of Torres- Vedras, Albuera, Salamanca, Vittoria, Toulouse. (1) Aspern, Wagram. (1) Smolensk, Borodino. Burning of Moscow. Retreat from Moscow. Passage of the Beresina. (1) Lützen, Bautzen, Dresden. (2) Dennewitz, Leipzig. (Battle of the Nations). Allies enter Paris.	Wounded in 1812, Napoleon in 1814 was forced to surrender France itself. By the treaty of Fontenoy he was expelled from the island of Elba and an annual renewal of 2,000,000 francs.

## NOTABLE WARS OF HISTORY—Continued

NAME OF WAR, CONTENDANTS AND DATES	CAUSE OF CONFLICT	LEADERS	CHIEF BATTLES AND INCIDENTS	RESULTS AND COMMENTS
<b>67. WAR OF 1812—1812-1814.</b> (1) United States vs. (2) Great Britain.	Controversies over aggression on neutral trade and British impressment of American seamen.	See page 138.	See page 138.	Peace of Ghent in 1814 led to the settlement of the northern boundary of the United States.
<b>68. WAR OF GRECIAN INDEPENDENCE—1821-1829.</b> (1) Greeks, aided by England, Russia and France vs. (2) Turks.	Revived feeling of Greek nationality, stimulated by a widespread secret society working for a restoration of a Greek empire at Constantinople.	(1) <i>Tyssilanti, Diebitsch (Russia), Kodrigion, (England), Byron, (England).</i> (2) Ibrahim, Pasha.	Massacre of Greeks at Chios (1) <i>Navarino, Adrianople.</i> (2) Missolonghi.	The treaty of Adrianople, 1829, compelled Turkey to acknowledge the independence of Greece, which chose as king the Bavarian prince Otto I.
<b>69. MEXICAN WAR—1846-1848.</b> (1) United States vs. (2) Mexico.	Boundary disputes occasioned by the annexation of Texas.	See page 140.	See page 140.	By the treaty of Guadalupe Hidalgo, Mexico gives up to the United States all territory north of the Rio Grande and Gila river, comprising Texas, New Mexico, California, Nevada, Utah, Arizona and part of Colorado and Wyoming.
<b>69. CRIMEAN WAR—1854-1856.</b> (1) Russia vs. (2) Turkey aided by Great Britain, France and Sardinia.	The question of the political status and future of the lands of the Turkish empire. Immediate cause, the claim of Russia to a protectorate over all Greek Christians living under the sultan's rule.	(1) <i>Meshchikov, Gortschakoff, Napoleon III, Garibaldi.</i> (2) Canrobert, Pelissier, (France), Raglan, Simpson (England).	(1) <i>Balaclava.</i> (2) Alma, Siege of Sebastopol, Inkermann.	In the peace of Paris (1856) Russia's claim to a protectorate is disallowed, the Danube is opened to navigation and the Black Sea is closed to war vessels of all powers.
<b>61. SEPOY MUTINY—1857-1858.</b> (1) Sepoys vs. (2) English.	Uneasiness created by the rapid progress of British ways and rule causes a revolt of native Sepoy troops of India. Immediate cause the rumor that cartridges furnished troops were greased with a mixture of hog and beef fat—the one animal an object of loathing to Mohammedans, the other of religious worship to the Hindus.	(1) <i>Nana Sahib.</i> (2) Nicholson, Havelock, Campbell.	Mutiny of Sepoys at Meerut. (1) <i>Massacre at Cawnpore.</i> (2) Delhi, Relief of Lucknow.	Following the suppression of the mutiny the charter of the East India company is revoked and India passes directly under the crown, a secretary of state for India being added to the British ministry.
<b>62. WAR OF ITALIAN LIBERATION—1848-1849.</b> (1) Sardinia-Piedmont and France vs. (2) Austria.	Since 1848 Sardinia-Piedmont had been the center of the movement for Italian unity. Following promises of aid from Napoleon III, Cavour traps Austria into declaring war over the question of disarmament.	(1) <i>Victor Emmanuel III, Garibaldi.</i> (2) Francis Joseph II, Gyulay.	(1) <i>Montebello, Magenta, Solferino.</i> Peace signed at Zurich, Nov. 10, 1859.	By this war Victor Emmanuel I, in 1860 Tuscany, Parma, Modena and the papal legations were added. In 1861 he gained Sicily and Naples, together with the title King of Italy. Venice followed as a result of alliance with Prussia in 1866 and the addition of Rome in 1871 completed the unification of Italy.
<b>63. AMERICAN CIVIL WAR—1861-1865.</b> (1) Federal Government of United States vs. (2) Southern Confederacy.	The election of Lincoln, which marked the triumph of the Free-Soil, Republican party, was made the pretext for secession and the formation of the Southern Confederacy. War followed upon the attempt of President Lincoln to supply Fort Sumter.	See page 141.	See page 141.	Resulted in the abolition of slavery and the preservation of the union.
<b>64. DANISH WAR—1864.</b> (1) Austria and Prussia vs. (2) Denmark.	Incorporation of the duchy of Schleswig with Denmark in violation of treaty of 1862.	(1) <i>Gahlenz (Aust), Prince Frederic Charles (Pruss.)</i> (2) Bismarck, Gortchakoff.	(1) <i>Invasion of Jutland</i> (2) <i>Storming of Düppel.</i>	Denmark gives up Schleswig-Holstein, which is jointly administered by Austria and Prussia.
<b>66. AUSTRO-PRUSSIAN WAR—1866.</b> Prussia with smaller North German States, and Italy vs. (2) Austria, Hanover, Saxony, and South German States.	Friction over Schleswig-Holstein enables Bismarck to force Austria into a war for supremacy in Germany.	(1) <i>William I., Prince Frederic Charles, Moltke, Victor Emmanuel.</i> (2) Benedek, Archduke Albert, Gahlenz, Prince Charles of Bavaria.	<i>In Bohemia:</i> (1) <i>Sadowa, Königgrätz or Sadowa.</i> <i>In the West:</i> (1) <i>Frankfurt, Sedan, Metz, Orléans, Capitulation of Paris.</i> <i>In Italy:</i> (1) <i>Custoza, Lissa.</i>	Closed with the peace of Prague, Aug. 23, 1866, which authorized the re-establishment of the federated German states, excluding Austria; Austria ceded Venice to Italy, and her rights in Schleswig-Holstein to Prussia. Hanover, Hesse, Nassau are also annexed to Prussia.
<b>66. FRANCO-PRUSSIAN WAR—1870-1871.</b> (1) France vs. (2) Prussia supported by German States including South.	Jealousy of France at Prussian gains and friction over Hohenzollern candidacy for the throne of Spain. Bismarck's falsification of the "Ems dispatch" tricked France into a declaration of war.	(1) <i>Napoleon, MacMahon, Bazaine.</i> (2) <i>William I., Moltke, Prince Frederic Charles, Crown Prince, Prince Frederic William.</i>	(1) <i>Saarlucken.</i> (2) <i>Weissenburg, Wörth, Vionville, Gravelotte, Sedan, Capitulation of Metz, Orléans, Capitulation of Paris.</i>	Closed in 1875 with the treaty of Versailles with the following result: (1) The Franco-Prussian power was destroyed; (2) the western frontier of Germany was reconstituted; (3) The German empire was established; (4) Germany acquired Alsace and Lorraine.
<b>67. RUSSO-TURKISH WAR—1877-1878.</b> (1) Russia vs. (2) Turkey.	Turkish misgovernment and revolts in her Christian subject provinces, which were barbarously put down ("Bulgarian atrocities") arouse all Europe but Russia alone declares war.	(1) <i>Grand Duke Nicholas, Gurka, Grand Duke Michael, Alexander II.</i> (2) <i>Suleiman Pasha, Duman Pasha, Mukhtar Pasha.</i>	(1) <i>Passages of the Danube at Shitova, Shipka Pass, Plevna, Storm of Kara.</i>	By the peace of San Stefano as revised in the congress of the powers at Berlin, Montenegro, Serbia and Rumania become independent; Bulgaria remains tributary but receives a Christian prince; Russia obtains large indemnity and part of Armenia and also Bessarabia.
<b>68. CHINESE-JAPANESE WAR—1894-1895.</b> (1) Japan vs. (2) China.	Rival claims to suzerainty over Korea.	(1) <i>Ito, Yamagata, Kuroki, Nogi, Yamaguchi.</i> (2) <i>Tao, Yeh, Wei.</i>	(1) <i>Yalu River, Port Arthur, Weihaiwei, Nanchang.</i>	Treaty of Shimonoseki, signed April 17, 1895, removed from China foreign influence; ceded Formosa and Pseudow to Japan; and awarded to the latter an indemnity of \$190,000,000.

## NOTABLE WARS OF HISTORY—Continued

NAME OF WAR, CONTENTANTS AND DATES	CAUSE OF CONFLICT	LEADERS	CHIEF BATTLES AND INCIDENTS	RESULTS AND COMMENTS
<b>69. SPANISH WAR—1898.</b> (1) United States vs. (2) Spain.	Interference of the United States on account of the insular warfare waged by Spain in an attempt to suppress Cuban independence.	See Spanish-American War, p. 144.	See p. 144.	By the treaty of Paris, Dec. 10, 1898, recognized the sovereignty of United States in Cuba, and ceded to this country the Philippines, Porto Rico and Guam, in consideration of \$20,000,000.
<b>70. SOUTH AFRICAN or BOER WAR—1899-1902.</b> (1) Great Britain vs. (2) Transvaal, Orange Free State.	Resistance by the Boers to the British form of government in the Transvaal.	(1) Sir George White Buller, Steiner, Roberts, Kitchener, French. (2) Cronje, Botha, De Wet, Delarey.	(1) Siege of Ladysmith, Paardeberg. (2) Colenso, Spion Kop, Vaal Krans, Magersfontein.	Boers surrendered May 31, 1902; are granted the right of self-government under British sovereignty, and united with other self-governing British colonies in South Africa in 1910, to form the Union of South Africa.
<b>71. RUSSO-JAPANESE WAR—1904-1905.</b> (1) Japan vs. (2) Russia.	Russian encroachments in Manchuria, and their fortification of Port Arthur.	(1) Togo, Kuroki, Oka, Nodsu, Oyama, Nagai. (2) Kuropatkin, Aleksei, Makarov, Stokelberg, Linievitch.	(1) Port Arthur and Chemulpo, Vladivostok, Yalu River, Dairen, Siege of Port Arthur, Mukden, Sea of Japan.	Closed Sept. 5, 1905, by treaty of Portsmouth by which Korea passes under control of Japan, China regains Manchuria, and Japan is granted important railroad rights.



## LANGUAGE

Language is the whole spoken and written body of words and methods of combining words used by a nation, a people, a race.

**Classification of Languages.**—The researches of philologists have resulted in the classification of the languages of the world into the following families and branches.

**The Indo-European or Aryan Family.**—This family is of greatest interest to us because our own tongue belongs to it, and the races speaking these languages are the foremost nations in the history of the world. They have produced the greatest and richest literatures; their languages have a great wealth of words; and because of these things philologists have made a more thorough study of these languages than of any other group, and a study of them is at the basis of our modern science of comparative philology. This family has eight branches.

**The Indian or Sanskrit Branch** has been used in India since 2000 B. C. or earlier. The oldest form is the Sanskrit, in which are written the Songs of the Veda. The Sanskrit, Prakrit, and Pali are now dead; the Hindi, Bengali, and Marathi are the modern representatives, and are spoken by 225,000,000 people.

**The Iranian Branch** occupies the great plateau of Iran and the valleys of the Euphrates and the Tigris. The dead dialects of this branch are the Old Persian, handed down to us in a few cuneiform inscriptions, and Zend, or Old Bactrian. The chief modern representatives are New Persian (in part), Kurdish, Baluchi, Afghan, and Ossetic.

**The Armenian Branch** consists of the living dialects of the Armenians, the written form of which has been changed little since the fifth century of our era. It is used by the people of the Caucasus and south of the Black Sea.

**The Greek Branch** comprises the ancient and modern Greek literary languages and dialects. Our own civilization owes much to the Greek language, since it was the means of transmitting to us the wonderful civilization of the ancient Greeks.

Much that is best in the literature, philosophy and art of modern Europe is due to Greek influence. The modern Greek is used in Greece, the Balkan states, Constantinople, along the coast of Asia Minor, Crete and Cyprus. It is the commercial language of the east Mediterranean.

**The Italic Branch** includes the ancient Latin, Umbrian, Sabellian, and Oscan, the Latin having in time entirely absorbed the other three. The Latin was the language of the Roman republic and empire and was used in western Europe and in the Mediterranean basin. In spite of the break-up of the Roman empire Latin continued to be the language of the literary and scholarly classes for many centuries. Even to-day the Catholic church uses Latin as its official language. With the coming of the barbarians the Latin was gradually modified and with it as a basis there were formed ultimately a number of new languages called Romance languages. They are Italian, French, Provençal, Spanish, Portuguese, Roumanian, and Rhaetian.

**The Celtic Branch** is more closely related to the Italic branch than to any of the other branches of the Indo-European family. At one time it was dominant in all of western Europe, but in the course of centuries it was gradually crowded toward the west and is now used only in the northwestern part of France and in the British Isles. There are two groups: (1) the Northern or Gaelic, including Irish, Gaelic or Scotch, and Manx, and (2) the Southern or Brittonic, including Welsh or Cymric, Cornish (extinct since the eighteenth century), and Armorican or Bas Breton in Brittany.

**The Slavonic or Slavo-Lettic Branch** is found in eastern Europe and has two groups: (1) the Slavic, to which belong the Russian, Bulgarian, Servian, Polish, and Bohemian; (2) the Lettic, comprising Lithuanian, Lettish, and Prussian (now extinct). This branch is spoken by about 150,000,000 people.

**The Germanic or Teutonic Branch** is divided into three groups: (1) the Gothic or East Germanic, (2) the Scandinavian

vian or North Germanic, (3) the West Germanic.

**The Italian Language** in its literary form was the old Tuscan dialect, and was given its literary preeminence through the writings of Dante, Petrarch and Boccaccio in the fourteenth century. Although the literary Italian is read and spoken by all the educated people of Italy there still remain numerous dialects throughout the peninsula, and it is impossible for a native of southern Italy to understand the dialect of northern Italy. The Italian is spoken in the various dialects by at least 35,000,000 of people in Italy, Sicily, Corsica, Sardinia, Malta, southern Switzerland, southwestern Austria, a small region in southeastern France, in Argentine Republic, Brazil, and the United States.

**The French Language** assumed something like definite form in the middle of the ninth century. There were various dialects in different parts of France, but soon two supplanted all others; the langue d'oïl, which was the language of the north of France, and the langue d'oc, the language of the south of France, which became the modern Provençal. These are thus named because the word "yes" was *oïl* and *oc* in northern and southern France respectively. The langue d'oïl had its origin in the dialect of Paris and the surrounding country, the Ile de France of Capetian times. Modern French was well formulated by the seventeenth century, and is known for its polish, clearness, conciseness, and logicalness. It has a rich literature and has been the diplomatic language of the world since the sixteenth century and is still largely used for that purpose. Outside of France the language is spoken in Belgium, western Germany, Switzerland, and eastern Canada, being used by about 37,000,000 people.

**The Provençal** takes its name from the region in which it originated, Provence, originally a Roman province. It was the language of the troubadours and the Albigenses and is still spoken by 8,000,000 people.

**The Spanish Language** arose in different dialects in the small states of the Iberian peninsula, but ultimately the Castilian dialect became the literary language. Spanish is very important, inasmuch as it is spoken by the people of Mexico, Central America, the southwestern part of the United States, all of South America except Brazil, many islands of the West Indies, and the Philippine Islands. In

all about 50,000,000 use the Spanish tongue; of these 20,000,000 live in Europe. **The Portuguese Language** resembles Spanish more than any other of the Romance languages. It is spoken in Portugal, the Spanish province of Galicia, the Cape Verde islands, Brazil, Portuguese Guinea, Angola, and Portuguese East Africa. In all between 15,000,000 and 20,000,000 people speak Portuguese.

**The Rumanian Language** is spoken by about 10,000,000 people in Rumania, southeastern Hungary, Bessarabia, Macedonia, Albania, Thessaly, Epirus, and Istria. The origin of the language dates back to the second century of our era, in which the Emperor Trajan conquered Dacia and colonised it with Romans.

**The Rhaetian Language** is spoken by about 100,000 people in the eastern part of Switzerland, especially in the canton Grisons.

**The Gothic Group** has long been extinct, and we know it largely through the work of Ulfilas, who in the fourth century of our era translated the bible for the Goths who lived in the Danube valley and north of the Black Sea. The language ceased to be used when the Gothic kingdoms fell, with one exception: a small remnant of the Goths found refuge in the Crimean peninsula and partially maintained their language until the eighteenth century.

**The Scandinavian Group** comprises four languages, Danish, Swedish, Norwegian and Icelandic. Until the eleventh century these languages differed very little from each other.

**The West Germanic Group** is the most widely spread of all the Teutonic languages and is divided into High German, Low German, and Anglo-Saxon or English. From earliest times there were several dialects of the German language, all having sprung originally from one common tongue. These dialects tended to increase in number and each had its own written form. From the configuration of Germany the various groups of languages take their name, High German from the upper, or higher, part of Germany and Low German from the coastal plain. The modern literary German originated in the fourteenth century. At that time the imperial chancery and many of the lesser courts in Germany adopted German for Latin as the official language. Naturally in the intercourse between the imperial and other courts the imperial dialect was adopted. The imperial dialect was, of course, that used by the local court of the emperors, who at that time were living at Prague. So a High German dialect (Franconian) became the *kandel-sprache* or official language of Germany. By the end of the fifteenth century this language was used not only for private correspondence but was used by some of the universities. Through the work of Luther this language was given its greatest impetus toward widespread usage. In his translation of the bible he used the language of the Saxon chancery because it was the most widely used dialect. The bible and Luther's numerous writings were read throughout Germany. Gradually one part of Germany after another adopted this as the written language. The German language is spoken by about 90,000,000 people in Germany, Switzerland, Austria, the United States, Brazil, Argentine republic, and in the German colonies. German is a very expressive and forceful language and its great writers and

thinkers have produced literary, philosophical, historical and scientific works which are unexcelled.

In the Netherlands a Low German dialect is the literary and official language, and is known to us as Dutch. About 5,500,000 speak this language. The Flemish, a language closely resembling the Dutch, is used in Belgium by about 3,000,000 Flemish people.

**The Anglo-Saxon, or English, Language** was introduced into the British Isles in the fifth century (A. D. 449) by Teutonic tribes—Angles, Saxons and Jutes—coming over from the Danish peninsula and northwest Germany. One of the most striking features of the English language is its composite nature; no other language is made up of such diverse elements. The English have been the greatest word-borrowers of all nations. When the Anglo-Saxons came to England they adopted some of the expressions of the Celts whom they conquered. In the sixth century, when England was opened up to the Roman Catholic church, various Latin words were introduced. During the ninth and tenth centuries, while the Danes controlled England, and afterward, many Scandinavian words were brought into the language. The Norman conquest (1066) caused the introduction of the great bulk of the French element, which of course was originally Latin. The era of the crusades brought in several Arabic words. The trade and maritime relations with Holland caused Dutch words to be introduced. The Renaissance added many Italian words. Many literary and scientific terms were borrowed from the Greek, especially since the sixteenth century. All the countries and peoples with whom the English had any political or commercial relations in modern times were made to contribute to the English vocabulary—French, Spanish, Portuguese, Germans, Persians, Chinese, Russians, Malays, Tartars, Hindus, American Indians, and Australian aborigines. Because of this cosmopolitan character of our language it contains more words than any other language, variously estimated at from 150,000 to 300,000. English is spoken by about 150,000,000 people in the British Isles, the United States, Canada, Australia, New Zealand, South Africa, and extensively in all the dependencies of England, such as Egypt and India. English is the commercial language of a large part of the world to-day and its influence in this field is steadily growing.

**The Semitic Family.**—This is second in importance because some of the Semitic people (Hebrews, Phenicians, Carthaginians, Assyrians, and Arabs) have played very prominent parts in the world's religious and commercial history and have made great literary contributions. It has two groups: (1). The northern group comprises the Assyrian and Babylonian, known to us through cuneiform tablets, Hebrew, Samaritan, Phenician, Punic or Carthaginian, Chaldean, and Aramaic or Syriac. All of these are now practically extinct, Hebrew being used to a large extent for religious purposes. The Old Testament of the Hebrew is of great importance to us because on it our religion is partly based. (2). The southern group comprises Arabic and numerous dialects of little importance. The Arabic was the language of Mohammed and is now used, for religious purposes at least, in all the Mohammedan countries—northern Africa, including Egypt, all

of the Turkish empire, and by about 50,000,000 in India.

**The Hamitic Family** has been sometimes classed with the Semitic, but insufficient proof of its connection has been produced. It has three groups: (1) The Libyan or Berber in northern Africa; (2) the Ethiopian, spoken from the southern part of Egypt south to the equator, the most conspicuous members being the Galla and Somali; (3) the Egyptian, the hieroglyphic language found on the old Egyptian monuments and papyrus remains. It had a modern representative, the Coptic, which, however, was overpowered by the Mohammedan conquest.

**The Ural-Altaic or Scythian Family**, like the Indo-European, is found in Europe and Asia, and has five branches. (1) The Finno-Hungarian is spoken by the Finns, Lapps, and Hungarians or Magyars. (2) The Samoyed is spoken in the northern part of Russia and Siberia, there being five dialects. (3)

The Turkish is spoken from Turkey in Europe, with its capital at Constantinople, to the Lena. (4) The Mongolian is spoken still farther east but does not reach to the Pacific. (5) The Tungusic is spoken by the Tunguses and Manchus in the north-eastern part of Asia. The grammar of this family is very simple; each word has an unchangeable root and one or more suffixes are attached, making it an agglutinative language. The western branches have a resemblance to the Indo-European family.

**The Monosyllabic Languages of Southeastern Asia (Indo-Chinese).**—Here belong Chinese with all its dialects, Siamese, Burmese, Tibetan, and all the Himalayan dialects. These languages consist entirely of monosyllables which can undergo no change. Each word or root can have the properties of various parts of speech according to its position in a sentence. The most important of all of these languages is the Chinese, it being the greatest in the world. The number of people speaking it is variously estimated at from 270,000,000 to 433,000,000.

**The Malay-Polynesian Family** is found in the Indian Archipelago and in Asia in the Pacific and Indian Oceans. It has three divisions: (1) The Malayan division is spoken on the islands extending from Formosa south to Australia and west to Madagascar, including Sumatra, Java, Borneo, the Philippine islands, the Celebes, the Molucces, Formosa and Madagascar. (2) The Melanesian division is spoken on the Solomon islands, the New Hebrides, and the Fiji Islands, and probably by the people of New Caledonia, the Marshall islands, and other small islands north and east of Australia. (3) The Polynesian division is spoken on New Zealand (Maori), the Samoan islands, the Tonga islands, the Marquesas islands, the Society islands, the Hawaiian islands, and Easter islands. These languages have a very simple structure, having many vowels and very few consonants. The Polynesian dialect is the simplest of the whole group.

**The Dravidian Family of Southern India and Ceylon** is spoken by 56,000,000 people and has no known relation to other languages. In the cultivated dialects the influence of the Sanskrit is very noticeable owing to geographical proximity.

**The Bantu Family** occupies the southern part of Africa from the equator south to Cape Colony, with the exception of a region almost coterminous with German Southwest Africa, which is occupied by Hotentots and Bushmen. This language has numerous dialects, and is characterised by its use of prefixes instead of suffixes.



**The Central African Languages.**—Between the Bantu family and the Sahara desert is a large group of dialects, numbering hundreds. These vary in structure, but philologists have not studied them sufficiently to come to any definite and satisfactory conclusions about them.

**The American Family** comprises the languages of the natives of North and South America, excepting the Eskimo language in the extreme north. There are over four hundred dialects altogether, the most important of which are the Athabaskan, the Algonquin, the Iroquois, the Shoshonean, the Siouan, and the Maya in North America; the Caribben, the Tupi, the Aymaran, and the Patagonian of South America. Whether these languages are derived from one original language is at the present time very doubtful.

**The Australian Family.**—In Australia and in Tasmania there are a number of related dialects which are rapidly becoming extinct. These languages have no importance except to the philologist.

**Isolated Languages.**—Besides these families of languages there is a considerable number of isolated languages. Such are the Basque in the Pyrenees mountains, the Etruscan (now extinct for 2,500 years) in Tuscany, some of the dialects of the Caucasus region, the Japanese and the Korean, the Eskimo language in the arctic region, and finally the clicking languages of the Hottentots and Bushmen in southern Africa, so-called because of the clicking sounds made by placing the tongue against the roof of the mouth and withdrawing it with a sucking action.

**Universal Languages.**—There have been over forty attempts to create a universal language which might serve as a means of communication for all peoples of the earth. Most of these attempts were made in the last fifty years. Those of greatest importance are: *Volapuk*, published in 1879 by Schlegel of Baden; the vocabulary, about one-third is of English origin, while the Latin and Romance languages furnish a fourth. The grammar is simplified to the utmost. *Esperanto*, published in 1887, by Zamenhof of Warsaw, latterly taken up for practical purposes in many countries, its use being promoted by special societies and periodicals. Its structure is so simple that the whole grammar can be completely mastered in an hour. There are no exceptions to the rules, perfect regularity being a leading feature of the language. The essential roots number only some 900, including grammatical inflexions, prefixes, and suffixes, and these are chosen from the principal European languages in such a way as to make them accessible to any person of ordinary education. *Ido*, a modification of Esperanto, published in 1907; and *Universal*, a very recent attempt of Molenaar of Bavaria.

**PRACTICAL ENGLISH.**—The word *English* as used above does not refer merely to English words. It concerns more than such questions as to whether this word or that is good English. It means the whole art of writing English for practical purposes, so far as that art is itself a practicable subject of study. It means not merely English, but the art of writing.

The art of writing has been studied systematically for two thousand years, and the principles laid down by Aristotle, after a careful inductive scrutiny of Greek authors, hold good for any language. They are psychological principles. They concern the nature of different audiences

and different situations, and the fundamental laws of appeal to all audiences and every situation.

Aristotle devotes a third of his rhetoric to a study of audiences. There is no more practical injunction to a writer than this: Know the man you are writing to. Adapt your discourse to him and to the situation he is now in. Books on rhetoric, if they mention this principle at all, are likely to defer it till they come to the subject of argument. We place it first. It will keep you from writing into the air.

Keeping this preliminary principle in mind, we may proceed to divide our subject into ten sections: (1) Structure of the composition as a whole; (2) Structure of the paragraph; (3) structure of the sentence; (4) diction, or the choice of words; (5) punctuation and capitals; (6) proof-reading; (7) argument and debate; (8) the forms of public speech; (9) journalism and short stories; (10) business English, especially business and social letters.

It will be observed that half of these topics deal with a great variety of particular situations—debates, after-dinner speeches, addresses, lectures, sermons, newspaper writing, short stories, advertisements, sales-letters, etc. The other and earlier half deal with principles which are applicable to all forms of writing, all audiences, all situations.

#### Structure of the Composition as a Whole.

No matter what the audience, or the situation, no piece of English is practically effective unless it has unity, coherence, emphasis, and proportion. These terms are formal and time-honored, but they are the summing up of centuries of practical experience.

**Unity** implies singleness of purpose. It rests on the fact that you can produce only one effect at a time. Don't scatter. Make your point. Stick to your subject. Learn to shut out half the things that occur to you. Don't divide the reader's attention. Don't let him wander away and forget you. It is now or never.

Conversely, don't omit the one thing that you really meant to say. It is not enough to avoid irrelevance; you must bring in all that is relevant. Every practical writer can remember the day when he used to fill paper with readable stuff, only to find—later on—that it was mostly not to the point, and that the thing which lay nearest to his heart didn't get written down at all.

**The Title.**—Choose your title and then narrow it to fit the situation. At this minute I am writing in my cabin in the woods, and the birds are filling the birches with melody. But can I write about "Birds"? No; nor about "North American Birds," nor "Michigan Birds," nor any other vast phase of a vaster subject. But just outside my window a Wilson thrush is repeating his liquid, mellow performance at intervals of exactly five seconds; and I might possibly manage an article on "Intervals of Song in the Thrushes of Northern Michigan."

**Outlines.**—If you would be certain of unity, make an outline. It may be a very simple affair, consisting of half a dozen items. But a careful scrutiny of it will tell you whether you are attempting too much, and whether all your items logically come under the title you have chosen. Unity consists in a vital relation between title and content. In the case of an argument the outline must be not a mere list of topics, but a list of statements. In those half-

dozen sentences you can read the whole theme in brief.

Never allow yourself to believe that you can't work from an outline. It is what all poor writers plead. The people who can't think till they have the pen in hand, and who then wander along after their own pens instead of guiding them—these are the people whose articles and letters are ineffective. Their stuff has no skeleton, no bones, no structure, no organic life. Make your work—not like an anglerworm, that will live if you cut it in two. Make it like a human being. Make it as vitally organized as you yourself are.

**Coherence** means more than mere cohesion; it implies a living connection of parts. It implies such an arrangement as will enable the reader to follow the thought readily. It implies a normal order. For narration the normal order is that of time; events must be set down in the order in which they occur. For description it is that of the relative position of objects, grouping, contiguity, nearness and distance, etc. For exposition and argument it is the logical relation of fact and observation to conclusion. When the parts of a composition are thus set down in their normal order a sufficient degree of coherence is usually established for the simpler forms of writing.

In the more subtle forms, however, such as exposition, and especially argument, coherence will demand not only a normal order but also connecting links in the form of conjunctions, transition sentences, and sometimes transition paragraphs. Such terms as "moreover," "consequently," "however," "on the other hand," "in the next place," my "second contention is," etc., are of great value in articulating an explanation or an argument.

**Emphasis.**—There will be a gain in emphasis if, without violating the principle of coherence, the items of a composition can be so arranged as to bring the most important or most striking at the end. The reader is more likely to remember the theme as a whole if his final impression is a strong or vivid one.

But the opening words of a composition are as important as the closing. Get attention at the start. Strike out at once for some vivid interest of the reader—only let it be a legitimate and not a sensational interest.

**Scale.**—It is often necessary to bring what one has to say within a certain assigned limit of space. This will call into requisition the faculties of comprehensive view and judicious selection. Inexperienced writers usually say a great deal more than is necessary to an adequate presentation of the subject.

A good exercise for training in the matter of writing to scale is to reduce a paper of one thousand words to five or six hundred without sacrificing any essential point. A converse exercise is to treat a given topic in five hundred words, expand it to a thousand, and then to five thousand.

Writing to scale is one of the best exercises for the development of a logical and organized sense of composition.

**Proportion.**—A piece of writing that is well proportioned is one in which the various points are given space in accordance with their relative importance. Of course mere physical size or mere extent of theme has nothing to do with that importance. The valve gear of a locomotive will probably call for more space than the boiler. Similarly a certain half-hour of your outing

may call for more space than the entire work preceding.

Introductions and conclusions should, in general, be very brief. Your paper must not be top-heavy, nor must you keep on after you have really finished. For a theme of five hundred words, probably the first one or two sentences of the opening paragraph will constitute a sufficient introduction; for one of twelve hundred to two thousand words perhaps one or two paragraphs might be required; for a book of three or four hundred pages the opening chapter might be reserved for introduction.

As a practical method of securing a right proportion, the assigning of a numerical value to the various topics of the outline will be found helpful. It may prevent the young writer from expending too much energy and flow of speech upon the first few points, and then telescoping the rest as the task begins to wear upon him.

#### Structure of the Paragraph.—Definition.—

The paragraph is a modern device for avoiding an interminable sentence. In modern times a man could write a sentence of five hundred words, a sentence that would cover two pages of print, and go scot-free. Scholars would read it, and nobody else read anything in those days. Nowadays people wouldn't. But those old Latin-trained scholars were aiming at a large unit of thought. Often they indented before and after such a sentence to show that it was a unit. Now we keep the indentations, but we break the long unit up into several.

We state the topic briefly in one sentence. We are content to state it merely. Then we go on to illustrate it or defend it or amplify it. It may take three or four sentences to do this, but they will all be closely related. The group of sentences is unified by a single topic. The indentation is a halting-place that permits the reader to breathe, look back, and fix the paragraph in mind.

So remember that the paragraph is a device to give you time. Take your time. Don't be afraid of making a short sentence if the thought is really emphatic. Save your long sentence to mass details of illustration or proof.

**Unity in the Paragraph.**—Our definition indicates in general what we mean by paragraph unity. But a bit of caution must be added with respect to the word *topic*. The amateur is likely to think of every item or point as a topic, and to indent accordingly. The result is a rapid-fire series of pseudo-paragraphs of two or three lines each, disconcerting and often misleading to the reader. Paragraph unity involves the generalizing of points under a real topic of sufficient note to command a real paragraph, with bulk enough to constitute a real unit of thought, and not a mere fragment. Colonel Roosevelt, in a paragraph about two hundred words, deals with the following points: Premiums on meritorious conduct of policemen, a new system of pistol practice, the Bertillon system for identifying criminals, a police bicycle squad, and a new municipal lodging house. These points are all generalized, however, under the topic "Minor ways in which we seek to refine the police force," thus producing a logically unified paragraph.

**Paragraph Length.**—What we have said above has its bearing on paragraph length. By our definition a paragraph is a group of sentences. It should contain, as a rule, therefore, not less than three sentences of average length—twenty-five to thirty words each. This is the minimum.

Your shortest paragraph should contain ordinarily not less than seventy-five to a hundred words. The paragraph consisting of a single long involved sentence should be avoided. Break such a sentence up into three or four shorter ones.

As to its maximum, a paragraph, even when theoretically well unified, should not include much more than three or four hundred words. A paragraph running on through several pages of print has a discouraging look to most readers, and is likely to result in a hasty impression. The normal average should be about two hundred words.

In three exceptional cases the short single sentence paragraph is in place. The first is that of *dialogue*, in which, by more or less arbitrary usage, whatever is said by a single speaker at one time, together with identifying or brief explanatory remarks by the writer, is put into a paragraph by itself. The second case is that of *special emphasis*, wherein the moment or point is of such supreme importance as to be briefly paragraphed by itself, and thus visually emphasized in the printing by its contrast with the longer units before and after it. The writer should be very sparing, however, in such use of the short paragraph, as any approach to a frequent use will naturally defeat its own end—that of emphasis. The third case is that of the *transition paragraph*, which expresses a brief summary, or anticipation, or both.

The number of paragraphs in a composition bears no necessary relation to the number of topics or points in an outline. It is possible occasionally to develop a theme by assigning a paragraph to each point in the outline. It is more probable, however, that related points will have to be grouped into a single paragraph; and it may be that a single point will require two or three paragraphs for its development. This is in accordance with what we have said about paragraph length and unity.

**Coherence in the Paragraph** means simply that every sentence shall be in its normal place in the paragraph, and that whatever connectives may be necessary to a ready progress of one's thought through the paragraph shall be supplied. The reader resents being led astray, and being compelled to zigzag through a paragraph.

**Proportion in the Paragraph.**—This means precisely the same as proportion in the theme as a whole, except that the principle is applied on a smaller scale. The points or subtopics in a paragraph must be given space in accordance with their relative importance.

**Connection Between Paragraphs.**—In exposition and argument it is often desirable to indicate the relation of paragraph to paragraph. This may be done by the conjunction at the beginning of the following paragraph (e. g., "Moreover," "Beside," "As a result," "Notwithstanding," "Of no less importance," etc.). Or it may be done by the transition sentence, which is usually the first sentence of the following paragraph, although it may be found preferable sometimes to make it the last sentence of the preceding one. Or it may be done by the short transition paragraph. This last, however, is usually reserved for connecting one group of paragraphs with another group, rather than for connecting paragraph with paragraph.

#### Structure of the Sentence.—Definition.

The sentence is the fundamental unit of discourse. Hence the "sentence-sense," as

it is often called, the ability instantly to recognize a sentence when one sees it, is a fundamental necessity of accurate writing. A sentence is a statement, question, or command that is grammatically complete—one that contains a subject and a predicate expressed, and that is not introduced by a dependent or subordinating word. The only exception is the imperative form, in which the subject is usually implied.

The sentence may be very short. The following are complete sentences (the first three being in the imperative form): "Wait." "Don't." "Come here." "I can't." "You're quite right."

A mere phrase (prepositional, participial, infinitive, etc.), or a dependent clause, is not a sentence, and may not stand alone as such. The following are not sentences: "In a few minutes." "Frightened almost to death." "Being sure of my ground." "Now, to proceed with the argument." "At least not at present." "Although of course we can't be certain." "Not unless you are willing," which is quite a different story. It is a mark of slovenly style to leave such expressions as these straying about like lost dogs. They must be attached to something—to a main clause of some sort; e. g., "I can't answer all these letters, at least not at present." Of course in conversation such expressions are common enough, but the only right use of them in written discourse is in dialogue, when they represent what was actually said.

The converse error is that generally referred to as the comma blunder. Complete separate statements, and those closely connected in thought, must accordingly be separated by the period, the colon, or the semicolon, but less often by the comma, unless there is a real conjunction joining the statements. The greatest temptation to the comma blunder comes when the second statement begins with a personal pronoun (he, they, it, etc.) or a conjunctive adverb (then, therefore, etc.), or when there is a close relation of cause and effect, or of contrast, between the two statements. The following sentences are correctly punctuated: "Come on, laddie. It's time to go home." "Tom wasn't afraid. He was simply waiting for the right moment." "You'd better not try that bridge. It isn't safe." "He would not take the crown; therefore 'tis certain he was not ambitious." "Be sure you're right; then go ahead." "Be sure you're right, and then go ahead." Special care should be observed in the writing of dialogue to avoid the comma blunder.

The only exception to the rule here stated is the case of the series form, in which short statements are sometimes separated merely by the comma; e. g., "I have fought a good fight, I have finished my course, I have kept the faith."

**Agreement.**—Grammatical correctness requires an agreement or concord between certain parts of speech in the sentence. The commonest error is to confuse singular with plural. A verb must agree with its subject in number; both must be singular, or both plural.

The writer is sometimes misled in this matter when the subject comes before the verb. Notice the following: "Here were located the banking facilities of the colonies" (not *was*). "Coupled with the demand for the teaching of patriotism have come suggestions as to what course such instruction should take" (not *has*). "There exist in the minds of many people certain

prejudices against the foreigner." (Not *crias*).

Subjects joined by *and* commonly require a plural verb; e.g., "There are my friend Barton and his wife coming toward us." (Not *there is or there's*.) "There are in this room a table, three or four chairs, and a small stove." (Not *is*.)

A plural noun connected between subject and verb sometimes misleads the writer: "The sound of his steps was gradually lost." "The size of the plates agrees with the current capacity of the battery."

A collective noun is to be construed as singular or plural according as its parts are thought of separately or in the mass: "The crowd were throwing up their hats and shouting with excitement." "The crowd was headed by McAndrews, who was carrying a red flag."

The pronoun must agree with its antecedent in number: "The negro did not ask for the suffrage; but the responsibility involved in it has been good for him." (Not *them*.) "The drill press is a very useful machine. *It* is made in various forms and sizes." (Or, drill presses are made; not *They* are made.) The indefinite pronouns, *each*, *everybody*, *any one*, *a person*, *one*, etc., are singular, and should be so construed: "A person must have plenty of time if he is to do good work." (Not if *they* are.) "England expects every man to do his duty." (Not *them*.)

The same is true of the correlatives *either*—*or*, *neither*—*nor* when they connect singular nouns: "Either Arch street or Bond street is to be paved at once." "Neither your assumption nor your conclusion is justified."

Certain miscellaneous cases of agreement may be noted: "All the printers were attired in *crack suits*." (Not *a crack suit*.) A student writes, "The faces of both Goldsmith and Johnson are disfigured." He should say: "The face of Goldsmith was disfigured, and so was that of Johnson." Again: "There were two stained glass windows on both sides of the entrance." This is ambiguous. The writer means either "A window to each side or two windows to each side."

**Goverment.**—Certain cautions must be observed in the use of nominative and objective. After *it* and *us* we must have the nominative forms of the pronoun: "Is it *I* whom you mean?" "I believe it is *they*." "Wasn't it *she* whom we met at Newport?" Do not use the objective form of the pronoun for the nominative, or the nominative form in place of the objective. "We boys are going to the circus." "Uncle is going to take us boys to the circus." The same holds true when two pronouns are joined by *and*: "He and I were asked to report on the power loom." "The instructor asked him and me to report on the power loom." "Mr. Barlow invited Frank and me to be present at the recital." "Between you and me, I think he will bear watching."

Who and whom follow the same rule as any other pronoun: "I can't remember who it was." "If *who* was present at the reception?" "Whom are you looking for?" "For whom are you looking?" "He is a man who, I believe, is well qualified for the position." "He is a man whom I believe to be well qualified for the position."

In this connection may be noticed the correct use of verb tenses. The confusion of present, past, and perfect tenses is unpardonable. We need only mention such horrible examples as, "He come up and introduced himself to me." "I think

he has went out to lunch." "The water was froze solid." "I seen at once that there was no hope."

The forms of *lie* and *lay* are as follows:

Present	Past	Past Participle	Present Participle
lie (lies)	lay	lain	lying
lay (lays)	laid	laid	laying

Notice the following sentences: "I usually lie down for a little nap after dinner." "Just as I lay down yesterday, Dr. Harmon called." "The leaves have been lying on the lawn for some days." "Lay your books on the shelf, and let them lie there." Less obvious are certain inaccuracies in the use of the perfect tenses. In general, whatever goes back of the main verb should be stated in the pluperfect tense: "I often wish I had been born in the country." (Not *was born*.) "Men and women who had been shut up all day in the houses and shops came out to get a little fresh air." (Not *were* shut up.)

**Unity.**—Unity in the sentence means on a smaller scale the same thing as unity in the theme and in the paragraph. The sentence must be about one principal thing. The does not imply that all sentences must be short: a very short sentence may be lacking in unity, while a very long one may be perfectly unified. "Peter Cooper founded Cooper Union, and his father made hats." Here is a sentence of only ten words, stating only two facts about Cooper, but the facts are so distinctly related that they do not belong in the same sentence. Now take a longer sentence: "The road winds along by the river bank, and affords a glimpse of the stream now and then; and it is a shady, quiet road; but once in a while there is a clearing, and there the sun is very bright and warm." Here are five facts about the road; but they are so stated that not one of them stands out as the unifying fact.

Such a sentence may either be broken up into two or three shorter ones, or some of the facts may be subordinated by the use of other connectives besides the over-worked *and*. Both methods might easily be applied to this sentence, and we should get something like this: "It is a shady, quiet road, winding along by the river bank, and affording a glimpse of the stream now and then; once in a while, however, there is a clearing, where the sun is bright and warm." A mastery of the principle of subordination, and of the various subordinating connectives, is more than half the battle for sentence unity.

Converse to the example just cited is the practice of writing a sentence in several separate fragments, when they really belong together: "We came to a path. It led off from the wagon road. It led through the woods. The path apparently was not much used. It was a narrow path." It should read somewhat as follows: "We came to a narrow path, apparently not much used, that led off from the wagon road through the woods."

**Coherence.**—So far as this principle applies to the sentence, it means that the parts should stand in a normal position. The subject must not be very far removed from the verb; modifiers must be reasonably close to the parts they modify; the reader must not be zigzagged through the sentence in a disconcerting way. A few examples will make the principle clear. The period should be inserted where indicated by the circled 1. "Last week I, with an old friend of my father's, took a trip to New York City." If a workman

is honest, he usually is repaid for his honesty." "Of course every body can't become the head of a great business concern." "I lived in the small western town in which I was born, for about three years." "While I was in New Mexico, I remember that I had a burro, which I rode every day." "The account was confirmed by Colonel Shackleton, who some years ago headed an exploration party to the far south, to-day." "In front of the stores, different kinds of electric lights hang." "His hat had a narrow black band around it, which had worn all summer."

A special case is that of condensed comparison, often attempted in such sentences as the following: "Every year was as bad if not worse than the year before." Such sentences are faulty in syntax as well as incoherent, and should be written as follows: "Every year was as bad as the year before, if not worse."

It is disconcerting to travel through a sentence like the following, with two *but's* in it: "Even in his letter to his wife, Macbeth shows that the temptation is strong, but he does not put it actually into words, but suggests that the third prophecy may come true." The second *but* of the sentence should read, "He does not, however, actually put it into words, but suggests," etc.

**Coordination.**—Parts of a sentence that are joined by coordinating conjunctions, such as *and*, *but*, or, should be similar in form: e. g., "This ordinance was passed by the village board May 13th last, and which is now in effect." This is bad form. Which after *and* must be elided, or else it must appear in the first part of the sentence. Either of the two following forms is correct: "This ordinance was passed by the village board May 13th last, and is now in effect." "We have here an ordinance which was passed by the village board May 13th last, and which is now in effect." Take another example: "Elaine's treatment of Lancelot shows not only how great her love was, but also that she was kind and gentle." It should read, "That she loved him greatly, or how kind and gentle she was," or that both clauses shall be introduced by *that*, or both by *how*. Again: "Finally the two friends parted, Savage going to the west of England, and Johnson remained in London." It should read, "Savage went," (with period after *parted*), or, "and Johnson remaining," so that both expressions shall be participial or gerund expressions. Again: "A protective tariff is laid not as a source of revenue, but to protect growing industries." It should read, "to produce a revenue," or, "as a protection for." Again: "The northern colonies produced wheat, corn, and potatoes; and in the southern, tobacco, and sugar." "During the war, Mr. Maki, both members active by writing, and the southern, tobacco, rice, and cotton."

A special case of faulty coordination is what is known as the false series. A true series requires that all the members be in the same grammatical form. One method of correcting a false series is to introduce another *and*, where indicated, for example, by the circled 1 in the following: "The men were at work making molds, Coeres, and fixing the cupola for the afternoon heat." "The sudden introduction of a large volume of water causes contraction, leakage, and necessitates rapid firing." "During the summer I got lost in a cornfield, got into two or three fights, and a few other disturbances." Another method is to supply such words as will make the three

members of similar construction; e.g., "The men were at work making molds, making cores, and fixing the cupola."

**Wordiness.**—In general all statements should be as brief as is consistent with clearness. The thought is often unnecessarily repeated in the words of a sentence; "to return again," "to try the attempt," "a fine-looking appearance," "during the meantime," "all the whole afternoon," etc. Such phrases should be condensed. Something more obvious, perhaps, is a certain loose extravagance of words resulting in a weak, spongy effect. The portions bracketed in the following should be excised: "It isn't right to lie to your employer in order [that you may be able] to go to the ball game." "You can see a number of fishermen fishing for [a species of fish known as the] black bass." "We drove along a beautiful road [which was] bordered by tall elms."

A careless writer will sometimes duplicate his constructions, especially his prepositions and conjunctions. The words bracketed in the following should be cut out: "The experience [of] which I am going to write about happened in my childhood." "It is argued that, because many children leave school at an early age, [that] their schooling should be such as will enable them to become good workmen."

A word may be said about repetition. There should be no awkward attempt to avoid repetition when it is necessary to clearness or effectiveness, but when neither of these ends is served the repetition becomes a burden. There is nothing gained by the presence of the bracketed words in the following: "Some of the lights were strung straight across the street, some [were strung] in a circle, and some [were strung] in arches." On the other hand, there is a distinct gain in force by the presence of those bracketed in the following: "I don't expect you to depend altogether on your notes, but [I do expect you] to study them." "If slavery is not wrong, nothing is [wrong]."

**Ellipsis.**—Words should not be omitted that are necessary to the grammatical or logical completeness of the statement. The verbal forms must be expressed whenever a change of construction makes it impossible for a single form to do double duty. Notice the forms supplied in brackets: "We rode back a great deal faster than we had [ridden] coming out." "Several proposals were received, but only one [was] considered." "All that Burns writes about is true; it has [taken place], and will again take place in the life of man." The same is true of the preposition: "We are not only prepared [for] but equal to the task." The article must be repeated when the nouns stand for distinct persons or things: "Thine is the kingdom, the power, and the glory." The sum and substance of the matter is this: "Goldsmith produced a descriptive poem, a novel, and a comedy that are among the best of their kind." "We think of Browning as a poet and as a philosopher." The must always be used before *United States*. Idiom requires the following: "All day," "all night," "all the morning," "all the afternoon," "all the evening," "all the week," "all the spring," "all the autumn (or fall)," "all summer," "all winter." An adverb should be inserted between *very* (or *too*) and the participle in *ed*: "very greatly pleased," "very well satisfied," "too highly delighted." That should not ordinarily be omitted from the indirect discourse construction: "It must be remembered [that] they had no difficulty in getting

the best education." Logical comparison requires insertions as follows: "The general appearance of the church is like [that of] most city churches." "His face has the appearance of [that of] a bright, hard-working young man." "Our basket-ball team ranks high compared with [those of] other schools." Correct syntax requires the following: "On the opposite shore from [that on] which the town is situated, you can see lofty hills."

**Reference.**—Pronouns and other reference words must be clear and explicit in their reference. The agreement of pronoun with antecedent has already been explained. A pronominal reference must not be ambiguous, as it is in the following: "Chesterfield had treated Johnson discourteously many years before when he had called on him." "The parasite lives on the host until all his energy is gone." "Duncan tells Macbeth that he intends to stay over night at his castle."

Reference must be explicit, and not merely implied: "There's no use writing to John; he won't answer it." Here it refers to the noun *letter* implied in the verb *writing*. Similarly we have sentences like the following: "He invited me to join him in a bear hunt, which I readily accepted." "True friendship is so rare that when you find one you cling to him like a drowning man to a straw. Sometimes the implied reference is in a noun: "The shore is very rocky at this point, and these rocks are broken by the force of the waves." "The marquis taxes the people for everything; they use; this money he spends in banquets and suppers." Occasionally it is the adverb that is not explicit: "The increase of patriotism is due to school training; it is here that the child is first taught to love his flag." "He fainted, and remained so for some minutes."

The participial construction is often difficult to handle. There must be a real subject to which the participle can be logically and grammatically related. The misrelated participle is a mark of careless thought and careless writing: "On preparing to leave the next morning, the ax could not be found." Grammatically this means, "The ax, on preparing to leave, could not be found." Now, it is not the ax that is preparing to leave. The writer really means, "On preparing to leave, we could not find the ax." The same fault is apparent in the following: "Some time ago, while attending a debate, the negro question was discussed, upon the anchor the breeze carried us down to the far end of the lake." "After scarifying the two pieces of iron, they are heated to a high temperature." "Being a girl, he saw that she was afraid to protest."

In this connection we may notice what Professor Newcomer has called sins against *logic* or *method*. One or two examples will illustrate: "Honesty is the best policy in business as well as any other place." But *business* is not a place, and cannot logically be referred to as a place. The sentence should read: "as well as in any other calling, or occupation." Again: "The same thing is true of the doctor, the lawyer, or any other profession." Medicine and the law may be referred to as professions, but not doctor and lawyer.

**Idiom.**—The bulk of the English language is made up of Latin and of Saxon terms. In the dictionary there are more words of Latin origin than of Saxon, but in the usage of conversation and in the most enduring monuments of our literature the Saxon element prevails. In general the inexperienced

writer will do well to rely mainly on Saxon words. They are the words with which he is most familiar. They have the merits of naturalness, directness, simplicity, strength, and emotional coloring. They come from the heart, and life, and experience. On the other hand Latin words afford the advantages of formality, dignity, sonority, and a certain lofty and superior tone of discourse. They also offer a more exact and discriminating choice of terms than the Saxon, and hence constitute by preference the scientific and professional vocabulary.

**Good Usage.**—The choice of words implied in the term good usage is impossible of exact limitation. The best we can do is to indicate certain forms that are to be avoided, and generalize from the result. In ordinary written discourse, except realistic narrative, the following classes of words should be avoided: *localisms*, such as "pearl," "sun-up," "tuckered out," "right smart," "some chills," etc.; *euphemisms*, such as "ain't," "mighty be," "didn't ought," "complected," "most everybody," "ole man," "auto," etc.; *improprieties*, such as "leave us see," "the balance of the morning," "a man who is well posted," "an invite," "real pleasant," "a nearby house," etc., and slang terms, except in rare instances; *colloquialisms*, such as "up-to-date," "anyway," "quite warm," "right away," "handy," "a nice time," etc.; *technical terms*, except when one is writing for a special group of readers, such as "tort," "metabolism," "eidolon," "pony brake," "isothermic," "epicycloidal," "oxymoron," "oemoplasm," "rheostat," etc.; *pretentious and affected terms*, such as "fatic encounter," "consorial parlor," "eubinary department (for kitchen)," etc.; *foreign terms*, such as "de trop," "in de sabbat," "cuisine," "sub rosa," "nil admirari," "seitgeist," etc.

Apart from such cautions little can be said. The right choice of words is the ultimate test of one's place among the elect, and is a thing which only in its more obvious phases is subject to rule. It is to be acquired in its finer and more real quality only through wide and sympathetic contact with the masters of literature. (See Correct Use of Words.)

**Precision.** or discrimination between words of related meaning, can be acquired by scrupulous attention to definition and usage. Certain grosser faults, almost as much matters of spelling as of meaning, are involved in the confusion of the following: There, their; to, too; its, it's; then, than; loose, lose; led, lead; forth, fourth; principal, principle; quite, quick; effect, affect; except, accept; later, latter; cavalry, Calvary. The writer should, however, train himself in the finer distinctions, such as are involved in obtain, attain; secure, procure; survive, recover; apt, likely, liable; imaginary, imaginative; poetry, verse; fact, truth; democracy, republic; egoist, egotist; human, humane; effective, effectual, efficient; grief, grievance; act, action, activity; last, latest; education, schooling, culture; accurate, correct, exact, precise; start, begin; politic, political, etc. (See Multiple Dictionary, or books by Fernald, Fallows, or Rogee. See, also, Dictionary of Homonyms.)

**Idiom.**—Every language has its idioms—peculiar personal forms that are in a way the meat and kernel of it, and yet often illogical and not amenable to rules or principles. No one knows English who does not know its idioms, and yet few suggestions can be given as to how they can be learned. They must be acquired by con-

fact and absorption. The most we can here do is to indicate a few idiomatic expressions by way of illustration.

Much of our idiom centers about the proposition. The cars stop at Adams street, not on Adams street. The picture hangs on the wall, at the right hand end of it, to the left of the door. There is a window in the west wall, not on it. We have the privilege of hearing a noted speaker, not the privilege to hear him. We are under the necessity of cutting expenses. We go into the room, and move about in it. There is a fence in front of the house, and one back of it, or to the back of it, or behind it (not in back of it). We leave about nine o'clock, in the morning, not around nine o'clock, and there are about twenty of us in the party. We say seldom if ever, or seldom or never, but not seldom ever, or seldom or ever. Similarly we say seems to be, or looks as if, but not looks to be. We have confidence in a person, and confide a secret to him, because we have a high regard for him on account of our long intimacy with him. Your way may be different from mine, but is not necessarily better than mine. The student will have to master these and hundreds of others, each in its own special application. (See Dictionary of Prepositions.)

**Proof Reading.**—The correction of proof requires scrupulous attention to every unit of composition from the smallest to the largest. Corrections should be indicated in the margin, as nearly as possible opposite the mistake. When this is not possible a line should be drawn from the mistake to the correction. Mistakes are indicated on the page by underscoring, crossing out, drawing a vertical line through certain letters, drawing a line around certain words, and placing the caret where necessary. Corrections should be made neatly, and should be absolutely legible and unambiguous.

The signs commonly used in the correction of proof are the following:

✕ Change bad letter.	□ Move over.
➔ Push down space.	◻ Em quad space.
↶ Turn over.	
✕ Take out (delete).	⌄ One-em dash.
⋈ Left out; insert.	⌄ Two-em dash.
✕ Insert space.	¶ Paragraph.
✓ Even spacing.	
✕ Less space.	No ¶ No paragraph.
✕ Close up entirely.	w.f. Wrong font.
⊙ Period.	..... Let it stand.
✓ Comma.	stet. Let it stand.
⊙ Colon.	Tr. Transpose.
✓ Semicolon.	caps Capital letter.
✓ Apostrophe.	s. c. Small caps.
✓ Quotation.	s. c. Lower case or small letters.
✓ Hyphen.	Ital. Italics.
⌄ Straighten lines.	Rom. Roman.

**Punctuation and Capitals.**—The Period as indicating the end of a declarative statement has been already explained. It must also be placed after every abbreviation, and after Roman numerals. The Interrogation Point is placed after a direct question, or a part of a statement that is a question: "Where are you going?" "What about the boy?" is a question that is more and more demanding an adequate answer. It is used—but with doubtful propriety—in parentheses to indi-

cate doubt: "The patriotism (?) typified by the *Dreadnought* is much in evidence," etc.

The Exclamation Point is placed after words and phrases that are decidedly exclamatory in character: "Oh! look! They're being driven back." "Oh, if John were only here now!" The words Oh and O are interjections expressing strong feeling. O is used in direct address and in expressions of surprise, indignation, or regret, and should never be followed directly by the exclamation point, "O Thou Great Helper of the weak, give us now Thy strength."

The Comma is used (a) to set off clauses within the sentence, as "The way was long, and the wind was cold." "Not that I loved Caesar less, but that I loved Rome more." (b) The dependent clause is usually set off when it begins a sentence, and is also set off when it ends one, unless closely connected in sense with preceding clause; "When you are ready, say so." "Come to the tent when you are ready." "We were about to give up the search and start for home, when we heard a faint call in the distance." (c) The relative clause is set off when it is additional, but when it is restrictive: "This road, which is the old St. Louis trail, runs past our farm." "Our farm is on the road which is known as the old St. Louis trail." (d) The comma is used to separate the members of a true series: "Days, weeks, months passed slowly by." (e) The present tense, used in a line upon line; here a little, and there a little. "Society has to care for the pauper, the delinquent, and the defective." "For winter is past, the rain is over and gone; the flowers appear on the earth; the time of the singing of birds is come, and the turtle doth turn to his hole." Notice the comma before and in the last two quotations. The comma is used to separate two or more adjective or adverbial modifiers when they are not logically an integral part of the word they modify: "A tall, young, handsome fellow he was." "A tall, handsome young man." (f) The comma is used to set off vocatives, and introductory and more closely related parenthetical elements. "My gentle Puck, come hither." "What mercy can you render him, Antonio?" "Well, honor is the subject of my story." "There is, if I remember rightly, a spring near the shore." (g) The comma is used to set off an introductory adverbial it may be regarded as a preposition: "Beyond, the mountains rose in their strength and silence." "Beyond the mountains lies the land of our hope." The comma, as does punctuation in general, marks divisions in the grammatical construction, and it is used especially to prevent misunderstanding. It should not be overworked, and must not be used to show elocutionary pauses. A good elocutionist may make a pause, called the rhetorical pause, after any word of a sentence, if by so doing he can increase the impressiveness of his interpretation.

The Semicolon is often used to separate complete statements that are so closely related in thought as to make the period too much of a stop. It should not ordinarily be used to separate a dependent clause from the main clause. It is used before i. e., "that is," and e. g., "for example." The Colon is used to present formally all the marks of punctuation. It is used to separate statements that are set in formal apposition with each other, the second being a repetition or explanation or illustration of the first: "The engineer is supremely the man of scientific imagination; he must see the structure before he builds it." The

colon was formerly much used to separate the two parts of a long compound sentence, if the parts themselves contained semicolons; but the practice is not to be commended. It is used, also, to introduce a list, or a quotation formally stated: "We have to consider, therefore, the three following propositions: government ownership, government control, and private enterprise." Motion, on page 24, was as follows: "A foundation task of the artist, etc." The colon is also used after the salutation in a letter: "Gentlemen: Referring to yours of the 14th, etc." No dash need follow the colon after such a salutation.

The Dash is used informally, somewhat as the colon is used formally: "There is only one method left—concession." "There were only three of us present—Hayes, Carter, and I." The dash also indicates a sudden break in the thought: Now, the alibi strata—but of course that doesn't interest you." It is further used to set off a parenthesis more decided than those enclosed by commas: "And that was his last experience—and almost every one has had—will understand what I mean."

The Parentheses, or curves, are used to inclose a still more definite parenthesis, one that is often independent grammatically of the rest of the sentence: "Late that night (it was about eleven-thirty, as a matter of fact) I became aware that he (Stanley) was retaining consciousness."

The Quotation Marks are used to include quoted matter that is stated in direct form. A quotation within a quotation is indicated by single quotation marks. Notice the following, observing, also, the use and position of period, comma, apostrophe mark, and capital: "He hardly agrees with you in that matter," said David. "I don't suppose," remarked Anne, quietly, "that there is anything more to be said." "Come here, Silas," said Arden; "I want you to look at this letter." "Why do you ask me that?" inquired the grocer, "when I have a few minutes left," continued my father, "Dexter came up to me and said, 'What are you doing here?'" But note the absence of quotation marks in the following: The printer said that the bill would come to about twelve dollars.

The Apostrophe is used to indicate possession. For the singular we add 's: "Henry's watch," "Fisherman's luck," "Charles's ideas." The apostrophe without 's is permissible when the noun ends in s; e. g., "Charles's ideas," and must be used alone in such names as Cæsar's, Achilles's, Moses's, etc. For the plural we add the apostrophe when the noun ends in a and when it does not: "The boys' tasks," "The ladies' aid society." "A book of children's stories." The apostrophe is less frequently used to indicate the possessive of objects; as, "the length of the field," not "the field's length," etc. But we say, "A year's absence," "two weeks' vacation," "at arm's length," "the water's edge," "a day's wages," "a dollar's worth," etc. The apostrophe is also used to indicate omitted letters in contractions: Don't, hasn't, you're, o'clock, etc. The 's is used also to indicate the plural of letters and figures: "Three S's." "He doesn't make his letters." "He doesn't make his figures."

Capitals are used in general to distinguish personal or individual names from class names: David Farragut, Harlequin, Hamburg, Ceylon, American, etc. The words river, mountain, lake, street, building, etc., and official and professional titles are capitalized only when attached to proper

names: the Ohio River, Lake Erie, the Borland Block, the Hamilton Club, Central Park, Amherst College, Doctor McDonald, President Harper, etc. The following words are regularly capitalized: names of the Supreme Being; important words in the title of a book, article, etc.; historical epochs, wars, etc.; days of the week and months of the year (but not the seasons), holidays, holy days, etc.; abbreviations of title attached to proper names, and also A. D. and B. C.; the interjection O and the pronoun I; names of relationship when immediately preceding the name (e. g., Aunt Amanda, Brother Amos), and Father, when referring to any of the orthodox writers of the early Christian church (as, the Fathers); names of things personified, the first word of every independent sentence, and of every direct quotation (unless it is a phrase or fragment not in dialogue), the first word after a colon if it begins a letter or a formal quotation, and the first word of every line of poetry.

**Argument and Debate.**—The purpose of *argument* is to convince some one of the truth or falsity of a proposition—to make him agree with you in your view of the matter. To bring some one else to think as you do means that you must have good reasons for your own attitude and be able to present them in a convincing way. We have to consider, therefore, what constitutes a good reason.

(1) Practically all our reasoning falls under two broad general laws—those of induction and deduction. *Induction* is the primary form of reasoning; it means the drawing of a general conclusion from specific facts and observations. You decide, from certain facts, that a particular business firm is unfair or unreliable. It is apparent that the soundness of your conclusion will depend upon your getting at the real truth of the matter, and getting at it in a broad way.

*Direct evidence* is, on the whole, the best kind of proof. What you have yourself actually seen or experienced, may well be offered in support of your attitude. The experience of some one else may, however, be more convincing than your own, if he is a more practical observer or an authority. In citing authorities, it is absolutely essential to cite the best, those who are known to be accurate, truthful, unprejudiced, and thoroughly informed. Depend on weight of authorities, not on number. In offering examples to support a contention, you must remember that "one swallow does not make a summer," and that, similarly, one example does not prove a contention. In the same connection we may notice that, because one thing happens after some other thing, the first is not necessarily to be declared the cause of the second. We may be pretty certain that, if a field looks fresher after a rain, it is because of the rain; but we cannot be so sure that, if the wheat field is discovered ablaze after the train has just passed, it was the train that set it ablaze. A step further removed is the argument by *analogy*. The growth of the lily from the bulb is an argument for the immortality of the soul, though it is a very beautiful symbol of it. *Indirect evidence* is often very strong, as, to quote Thoreau, when you find a trout in the milk; but it is subject to the same allowances as direct evidence. The presence of a man at a horse race may indicate that he is interested in racing, but not that he is a gambler.

(2) The other general law of reasoning is that of *deduction*. It consists in the application to a specific case of a general

proposition that is already admitted. The general proposition (major premise), its application (minor premise), and the resulting conclusion, constitute what is known as the syllogism. Take an example: Governments derive their just powers from the consent of the governed; our government of the Philippines is without their consent; therefore it is unjust. It is obvious that you must be absolutely sure of your premises, or else your conclusion will be false. Practically every argument involves both the inductive and the deductive process.

(3) The presentation of arguments by speakers on both sides of a stated question constitutes a *debate*. The purpose of debate is, or ought to be, to get at the truth of the matter; and nothing can be more humiliating or demoralizing than the use of subterfuge, quibbling, rant, abuse, and intellectual trickery for the trivial satisfaction of beating one's opponents. The question chosen for debate should have two distinct sides to it. It should be stated affirmatively; e. g., Resolved that the United States is justified in her occupancy of the Philippines (not, is not justified). The question should be discussed, and so formulated that both sides understand exactly in what sense it is to be understood. Then the preparation of the debate should proceed. The affirmative should proportion the arguments among its speakers, and the negative among its speakers. Each speaker should then study his argument, formulate its terms, collect his material, and prepare his brief.

The brief is the most important step in the process. It consists of a statement of the points which the speaker proposes to make, arranged in a logical way as main points, minor topics and sub-topics. The order should be that of increasing importance, the weaker points coming first, and the stronger ones toward the end. All the points in the brief should be stated in the form of complete sentences. The speaker must prepare his refutation as well as his direct argument; that is, he must answer arguments that will be made, or might be made, on the other side. He will do well also to consult frequently with his colleagues to see that there are no overlappings or omissions. When the brief is completed, the argument should be written out in *extenso*, and absolutely mastered. It need not, and ordinarily should not be learned word for word. But the speaker must be sure of the exact phrasing of certain points, and must make certain that his transitions are easily apparent. In the delivery there should be no shouting, no striving for applause, no cheap allusion to the "ignorance and stupidity of our opponents." Speak calmly, naturally, firmly, quietly, and above all courteously.

**The Forms of Public Speech.**—We may distinguish the after-dinner speech, the address, the oration, the lecture, the sermon.

**The After-Dinner Speech** must be short and informal, yet it may be weighty. The greatest offense of after-dinner speeches is tediousness. One good story is better than half a dozen. The diction should be eminently simple; for it is the very essence of the social temper to avoid technicalities on the one hand and extravagance on the other. Simplicity, restraint, and understatement are marks of breeding. Yet an examination of five-minute addresses by such men as Lowell, Curtis, and Henry Grady shows that this tiny form of com-

position may express important thoughts: it can get down to fundamentals; it can set up noble ideals. It can be "built like a watch," obeying on its own scale all those rules of organization which have been previously set forth.

**The Address** is a dignified speech of considerable length and great variety of subject. In a recent collection of addresses we note such topics as the influence of universities, the leadership of educated men, the scholar in a republic, the drama in America, the child and the state, general amnesty, secession. The presidential address of a society usually sums up recent tendencies which interest the society, and then gives some outlook on the future. Such is Miss Jane Addams' address on "Charity and Social Justice," before the St. Louis Congress of Charities, 1910, an address marked by broad historical retrospect and a penetrating philosophic prospect. The tone, or degree of dignity, in the diction of an address must be high. Humor must be kept very subordinate, and colloquialisms must be rare. On the other hand, unnecessary technicalities must be avoided, and display must be entirely absent. Before a recent meeting of the American Philosophical association the "papers" were so technical that even the members wrangled for hours as to their meaning. But the presidential address, by the late William James, on "The Energies of Men," was given in language so picturesque and clear that it was sought by a popular magazine, and was quoted far and wide.

**The Oration** is an elaborate discourse, treating an important subject in an impressive manner. Its purpose is not primarily that of the address; it seeks sooner or later to move the listener to some definite action. For this reason it is commonly felt that an oration should not be read; it should seem impressively impassioned and extemporaneous. The very name suggests *oral*, and recalls the whole ancient tradition of *rhetoric*, or public speech. It recalls Aristotle, with his distinction between the oratory of deliberation and that of display. Ancient *epideictic* oratory permitted a certain amount of display and beauty for its own sake. The modern form of oration which still preserves this tradition is the *eulogy*. Blaine's eulogy upon Garfield is a striking example of the legitimate exercise of the power of pure oratory. One who listened to the nominating speeches in the Republican Convention of 1908 cannot help regretting that the power of dignified eulogy—eulogy which unites a significant man to the times of which he is the expression—is practically lost. But the loss has some compensations. It is almost wholly a gain that young men are now advised to study Wendell Phillips instead of Daniel Webster. The plain, direct, conversational style is far more effective to-day than the older decorative and rhetorical style.

The basis of every good oration must be good organization and sound argument. Beyond that, the most important thing is for the orator to know his audience, that he may appeal to their sympathy, and, if need be, to their selfishness. Remember that Aristotle, that great student of humanity, devoted a third of his treatise on oratory to the psychology of different audiences.

**Journalism. Short Stories.**—Perhaps the most valuable single gift to the journalist is the sense of mass and proportion. He must write accurately to space. He must

dwell on the significant, and boil the less important down to its lowest terms. Headlining is a science in itself, and keeps one man busy on every day, for it is the art of telling the whole story in a few phrases. As for diction, the trend of the times is toward simple words. It is only in rural districts that we find "fine writing," pretentious phraseology. Here it is often due to forcing an ignorant man to report something that he knows nothing about—as, for example, in this: "He has a pliable tenor of immense range, coupled with deep organ tones in his lower register. He will doubtless advance into deserved prominence in that mimic world which proves so fascinating to the actor and the singer." The day is passing when reporters talk about "infuriated animals" when they mean runaway horses. Headlining, however, has one bad effect on diction. It leads to the coining of short and ugly cant words, like *tail-feet*, to fit the exigencies of space. A sensible reporter avoids smartness in his diction; the people want the news, and not his verbal antics.

**Short Stories.**—The writing of short stories is an art which has grown with journalism and is closely allied to it. The short story finds its audience in the tired business men and the tired youths and maidens who shrink from prolonged dealings of mind with novels—especially the sociological novels of the day. This means that the short story must be so constructed as to capture weak attention. An allegory or a tale, however lovely, does not do that, because it lacks plot and surprise.

Plot and surprise, then, the short story must have. Its material may be realistic or romantic, but it must be worked up into a story. On the other hand, there can be no intricate and elaborate plot, for that takes up space and time. The problem is to get a surprising incident, a surprising turn of affairs, and lead up to it neatly and briefly. The events must not cover a long period; the past must be ruthlessly forsook; a single day, sometimes a single hour, must disclose the whole complication and resolution of the events. So, as Brander Mathews has put it, a short story is not merely an abridged novel.

Again, there is no opportunity for showing the development of character. If there is to be change of character in your hero, you must catch him at the moment before the change comes. Most short stories do not attempt character-change, but deal with incidents. Of course, the more significant the incident is, the better. The ideal thing would be to catch the most important day, hour, and incident in the hero's life.

A good beginning is half the battle for it gets you your reader. Make it fresh and striking. Roughly speaking, do not begin either with description or with dialogue. Votes have shown that both are less acceptable than a paragraph which flashes before you an intrinsically interesting person or a striking situation.

Avoid dialect: there is no sale for it now, except to a few magazines from a few masters.

Avoid unpleasant and ghostly and cynical and "suggestive" material. Pure love, heroism in daily life, friendship, loyalty, ludicrous happenings, fair and honorable getting on in the world; hope, poetic justice—these are the themes that sell. Be human and don't be trite, hackneyed, or commonplace.

Choose your title as carefully as if you were advertising.

Study your market—as in the book *1001 Places to Sell MS.* (Editor Co., Ridge-wood, N. J.)

**Sermons.**—A sermon is not a lecture, although preachers sometimes forget the fact. The primary business of a sermon is to influence the human will in such a way as to bring the eternal into time; to make men feel that they may live the eternal life in the midst of time; and to make them attempt this divine task immediately. This definition may seem vague and abstract, but neither *eternal* nor *will* can be omitted from it. The teaching of morality without reference to spiritual motives is not preaching. The words *eternal* and *spiritual* are indeed difficult of definition, but the practical and progressive definition of these words is precisely the homiletic task.

So far as literary art is concerned, this end may be achieved by, say, three means: vitality of diction, vitality of organization, vitality of direct appeal.

Vitality of diction may best be studied in the sermons of the Christ. What strikes the literary student here is the variety, homeliness, beauty, and freshness of the language. The kingdom of heaven is not formally or scientifically defined. It is a kingdom of children, and of men reborn. It is a pearl, a net, a wedding-feast, a piece of silver, etc. This warm flood of fresh spiritual poetry was poured by the Great Preacher into the formal and frozen vocabulary of the Pharisees. No evangelist can be effective who does not learn this lesson. Preaching means relating the eternal to the ever-changing temporal, and the universally spiritual to the individually human.

Vitality of organization means that the whole sermon is easily grasped, that its main divisions are easily remembered, and that the point of the whole could be expressed in one paragraph or sentence.

Vitality of direct appeal means that the end is direct and forcible; that the peroration is not for display, but to accomplish a piece of mental hauls. Lyman Beecher drove one of his theological students back into the pulpit, and cried: "You have not cracked your whip; your whip has no lash." The figure was not wholly happy, for a preacher should leave his audience with a sense that he loves their souls more than he loves to lash them. But it emphasizes the indispensable appeal to the will.

Preaching from texts is primarily exegetical; but exegesis must not stop with formal explanation; it must run deep into life; here and now there are words and situations of common life which are essential to such exegesis as really comes home to men's business and bosoms. From the literary point of view there is one thing about texts, which the present writer does not remember to have seen mentioned. The Bible is full of superficially contradictory texts. This is because, of all books, it is truest to life. It does not blink the paradoxes of experience, but reconciles them by the will. A sermon on private prayer (Matt. 6: 8) should logically include or be followed by one on religious solidarity (Matt. 6: 10). It is characteristic of the Christ that he demands the coming of the whole kingdom as the first interest in the most private petition.

The diction of sermons should have a full Saxon element, and should be free from aeolisms. The pulpit has done too much toward introducing such pretentious words as *enthuse* and *mentality*. The pro-

nunciation of the preacher should be correct, not eccentric; this is for no other reason than that false or eccentric pronunciation diverts the attention of the critical (and that means all the young) from his message.

**Lecture** means "reading," and most lectures are read—at least by the authors. They vary from the technical lectures of a university to the popular humorous lectures of a Bill Nye. Even in the case of popular lectures, no two styles or messages could differ more than Matthew Arnold's lecture on *Numbers* differs from Artemus Ward's on *The Alchemist*. In the very same evening Wendell Phillips used occasionally to give his famous lecture on *The Lost Arts*, and follow it with an impassioned appeal to the same audience on the iniquity of slavery.

But in all popular lectures it is the primary purpose to please rather than to exhort. There must be fresh information, and there must be fresh humor. Scientific terms, if used at all, must be used sparingly, and must be explained. A wise lecturer will note the effect of his first delivery on the audience, and will remodel the lecture accordingly. Long descriptive passages will be shortened. Even in narratives of travel the human element must be present in every paragraph; for, as Stevenson said: "Nobody talks about mere scenery for more than two minutes at a time."

**Business English. Social and Business Letters.**—Saxon and Latin Elements.—Many of our most technical business words are of Latin origin; e. g., *advertise, auction, bill, bona fide, bonus, cancel, capital, chest, credit, collateral, competition, co-operation, corporation, currency, fiscal, fortune, gratis, grocer, guinea, interest, item, lien, mint, money, pecuniary, pound, premium, redeem, salary.*

A study of the history of these words, as found in any good unabridged dictionary, will throw a flood of light upon the movements which have produced modern business conditions. But, apart from these technical terms, it is inadvisable to load business English with Latin derivatives. Saxon terms still make the strongest appeal to the emotions and the will, and goods cannot be sold unless the will is touched. Plain, simple, strong words are the most effective. People's love of food, dress, the family—this must be reached; and it is best reached through words which were earliest associated in the buyer's mind with these deep interests.

**Degree of Dignity.**—But plain, simple words are not necessarily slang words. Business slang has so vast a vocabulary that it vitiates the usage of everybody. Business expressions are tending to displace social and literary expressions. Many Americans speak of "the balance" of the day instead of "the rest"; they speak of a man as "well posted," as if he were a ledger; and instead of asserting, declaring, maintaining, contending, they "claim" everything.

The young business man will not regret mastering certain more dignified phrases for many of the commoner vulgarisms of business parlance. If he is in the habit of saying *ain't*, he should master the following: *I'm not; you're not or you aren't; he's not or he isn't; we're not or we aren't; they're not or they aren't.*

Business English cannot always be as dignified as literary English, for business deals with all sorts and conditions of men. But a business man must command more than one vocabulary. Note the following

list of phrases, the second of which in each pair is the more dignified: *knock, complain; boast, praise; folks, family; cheap, inexpensive; back down, recede; anyway, at all events; a great success, very successful; mighty fine, extremely fine; right then, just then; quite a few, several; fired, dismissed; faked, falsified; hadn't ought, ought not; endorse, approve; auto, car; without, unless.*

These are merely examples. Different situations and different customers require different vocabularies. But in general, business English should be plain and forcible without being vulgar. It is an error to think that educated customers wish to be addressed in magnificent words and swelling sentences. A truly educated man speaks simply. He goes to bed—not "retires"; has legs, not "lower limbs"; eats dinners, not "banquets"; builds a house, not a "residence"; calls a soup delicious, not "elegant"; has in his house a kitchen, not a "culinary department." If he receives a booklet advertising certain goods in highflown and bombastic language, he is as much offended by it as if it were full of such words as *fake, knock, boost, graft, boodle, swell, coads.*

**Wordiness.**—Time is money, and business English should cultivate brevity. A few words that catch the eye, hold the attention, present the arguments in a nutshell, are better than wilderness of fine expressions. This principle applies to every form of business composition, from advertisements to reports, from letters to booklets. Yet there is no merit in mere brevity. The few words must be the right ones. The short paragraphs must contain much meaning. Important facts must not be omitted. And if a good deal depends on one word, that word should appear often enough to be remembered.

This is particularly true in advertisements. A good advertiser keeps his key-word before the people. He varies the context to give freshness and attract attention, but he does not allow you to miss his precious word—his "Napoli" or "Gold Dust Twins" or whatever it be. Into that word or phrase he packs as much of his story as possible.

Also the name and address of the maker are never absent from a good advertisement.

The headlines of an advertisement, like the headlines of a newspaper item, are extremely important. Their business is to catch the fleeting attention, for (as has been proved by the investigations of Professor W. D. Scott) people do not spend more than one-tenth the time on advertisements that they spend on the text of a paper or magazine, and many persons are unaware that they ever read advertisements—though we all do. A clear Saxon phrase, striking at once into some genuine human instinct or interest—this is the proper opening of an advertisement.

Not the price, but the quality—that is the important matter to name tellingly.

**Business Letters.**—We may distinguish three essentials of a good business letter: first, *courtesy*; second, *clearness*; third, *persuasiveness*. Brevity has been mentioned above.

**Salutation and Closing.**—Courtesy requires, first, that the salutation and the leave-taking should be free from brusqueness or indifference. Every man is entitled to the abbreviation *Mr.* before his name in the salutation and on the outside of the envelope. Physicians and other professions of men are never offended if their correspondents

take the trouble to give them their right professional title. Firms are entitled to be addressed as *Messrs.*, though incorporated companies—e. g., The Macmillan Company—are not usually so addressed nowadays. *Dear Sir, Dear Sirs, Gentlemen, Dear Madam,* are proper business salutations. The last-given applies equally to girls and married women. The leave-taking may be *Yours truly, Yours very truly, Very truly yours*—the capital being used for the first word only. An unmarried woman should prefix *Miss* to her signature, or should place her full address to the left. A married woman should sign her legal name, and then place to the left the exact address which she wishes to see on the envelope of the reply, thus:

*Yours truly,  
Ellen Gates Adams.*

*Address:  
Mrs. James Ward Adams,  
1372 Linden avenue,  
Chicago.*

Care should be taken to avoid hackneyed, curt phrases, such as "Yours received and contents noted." The letter should have some ease, some individuality. It should impress the receiver as a piece of the courteous conversation of an educated and alert business man. Note how beginnings of replies may be varied: "We are glad to learn from your letter of March 12," "The impression that we get from your favor of the third," "We are glad to have your inquiry of the seventh concerning," "You advised us on the fifth of last month that."

In cases where business relations are long established, the social form of salutation may be used; as, *My dear Mr. Jones*. This, however, should follow the full name and address of the person saluted, since business is business, and the letter is addressed to a particular Mr. Jones. Go out of your way to get his name right, and sign your own name uniformly every time; don't have John G. Jones doing business with F. H. Smith one day, and J. G. Jones with Frank H. Smith the next. Or, the name of the address may be put at the end of the letter, to the left of your signature.

Latterly it is the custom of many correspondents to begin sales-letters to strangers with the familiar *Dear Mr. Jones*. A good many people resent being so addressed by strangers. The form is not to be recommended, although it shows that the would-be seller is taking pains to be personal.

**Circular or Form Letters** are a necessity of modern business, and great things are claimed for them by houses that make a business of preparing and supplying them, together with specially inked ribbons which make it possible to match the salutation with the body. But no form-letter can wholly take the place of the individual letter. The personal touch at the end—"The last time I saw you"—cannot successfully be imitated in any form-letter.

In all business letters it is both courteous and persuasive to say as little as possible and yet as much as possible, provided conciseness and undue familiarity are avoided. The customer is not much interested in your affairs or your success; he is deeply interested in his own. You must learn to take his point of view.

**Collecting Letters.**—In answering letters of complaint or in sending collection letters, courtesy must be observed with especial care. The hotter your correspondent's tone, the cooler should be your own. Do

not argue with an angry man. Take all the blame you honestly can, and then be generous, if you would keep your trade.

Clearness means that descriptions and terms should be beyond mistake. Description of goods should be exact, but not tedious. The person addressed must receive a clear mental picture, and without undue effort. Try to hit the thing off in telling phrases, presenting the goods imaginatively—i. e., in a way that satisfies the buyer's needs.

**Sales Letters.**—A good sales-letter begins by nailing attention; the start is half the battle. It proceeds to describe the goods. Then it gives reasons for buying them—for the particular man's buying them; but he should not be furnished with descriptions of competing goods, for that divides his attention, increases his responsibility, and often unintentionally suggests buying elsewhere. Then the letter closes with some inducement to act promptly. The imperative mood—"Do it now!" is well enough if reasons and inducements have not been offered; otherwise it is an impertinence.

Too much care cannot be exercised in the selection of stationery, the type of engraving or printing, penmanship or typing, etc. The first impression of a letter is given not by its subject matter (ideas, phraseology), but by its general appearance. A letter represents to some degree its sender, and one should not forward a shabby or a gaudy missive; these characteristics do not inspire confidence.

**Social Letters.**—We distinguish (a) formal notes in the third person, (b) notes to a stranger, (c) notes to acquaintances, (d) intimate personal letters.

Formal notes should be in the third person throughout, except when engraving makes the word "your presence" necessary. Thus: *Mr. and Mrs. Charles Henry Webster request the pleasure of Mr. and Mrs. James Henry Hammond's company at dinner, Monday, June the seventeenth, at seven o'clock.* Below, at the left, appears the street number of the sender, and the date, thus: *1274 Washington avenue, June the third.* The acceptance reads: *Mr. and Mrs. James Henry Hammond accept with pleasure the kind invitation of Mr. and Mrs. Charles Henry Webster to dinner on Monday, June the seventeenth.* The sender's address appears below at the left. Regrets read: *Mr. and Mrs. James Henry Hammond regret that a previous engagement prevents their acceptance of Mr. and Mrs. Charles Henry Webster's kind invitation to dinner on Monday, June the seventeenth.*

These forms are pretty definitely fixed, and do not admit of much alteration or addition. The full names are used; it is at dinner in the invitation, to dinner in the reply; it is on Monday in the invitation, and on Tuesday or Monday in the reply. It is June third or June the third, not June 3d; and the year is not given. Wedding invitations of course give the year, and etiquette varies slightly in other details from year to year, as any good stationer is able to indicate. Previous engagement covers all excuses in regrets. Illness in the family, absence from the city—these expressions may be used, but are not necessary; and other excuses are inserted at the risk of bungling the note. Notes to a stranger begin *My dear Sir*, or *My dear Madam*, and his or her name appears at the left at the end. *Yours sincerely, Yours very truly* are proper endings. *Yours respectfully* is no longer used by careful writers in any sort of letter. *Yours cordially* is impossible in a note to a



stranger, and is of doubtful taste except when used by women in social notes. Observe the use of capitals in *Sir* and *Madam*, and the small letter in *dear* after *My*.

Notes to acquaintances begin with *My dear Mr. Jones*, *My dear Miss Jones*, *My dear Mrs. Jones*, and end *Yours sincerely*, *Yours very sincerely*, *Very sincerely yours*. The addressee's full name need appear nowhere save on the envelope. In no kind of note or letter should a clergyman be addressed or referred to as *Rev. Jones*. The initials, or the name, or *Mr.*, or *Dr.* must appear after *Rev.* The best form is *The Rev. William Mead Jones, D. D.*

Notes and letters to friends and intimates are of every shade of familiarity. *My dear Mr. Jones*, *My dear Jones*, *My dear William Jones*, *My dear Billy Jones*, *My dear Billy*, *Billy*—all of them are good if used with tact. Signatures vary from *Yours sincerely* to *Yours ever* or *Yours*, and may respond still farther to personal affection, whim, or humor. *Your friend* is very rarely used, but it comes from a certain people who mean it. The tone of intimate letters should be individual, recalling the very voice and gesture of the writer. All pretense, all stiffness, all bookishness must be absent from a truly intimate letter. In their place there is room for all the personal charm that the writer can command.

**FIGURES OF SPEECH.**—For practical purposes the distinction sometimes made between figures of speech, figures of grammar, and figures of thought, may here be discarded. The essential principle, which the reader may apply for himself, holds the same in all.

**Definition.**—A figure of speech is a means of expressing or intensifying one idea in terms of another. This fusion of terms is the essential principle of figures of speech; it is called *connotation*. That is to say, in addition to what is *denoted* or literally meant, there is *connoted* something else which serves as a helping or carrying idea. This connoted idea may be a distinct thought in itself, in which case its value is mainly illustrative; or it may be merely felt in the manner of expression, in which case it has an emotional value of some kind. The two values may be proportioned or blended in many degrees; but in any case the principle of connotation is present; the reader is made to think or feel somehow in terms foreign to the literal idea.

**Illustration.**—This connotation of ideas may be seen in its simplest form in the following paragraph from Macaulay, in which he is explaining the difference between two kinds of historical composition, the descriptive and the philosophical: "Of the two kinds of composition into which history has been thus divided, the one may be compared to a map, the other to a painted landscape. The picture, though it places the country before the eye, does not enable us to ascertain with accuracy the dimensions, the distances, and the angles. The map is not a work of imaginative art. It presents no scene to the imagination; but it gives us exact information as to the bearings of various points, and is a more useful companion to the traveler or the general than the painted landscape could be, though it were the work of the ever Rosa peopled with outlaws, or the sweetest of which Claude ever poured the mellowness of a setting sun." Here the terms applicable to a map and a painting respectively, used purely to illustrate, are of material aid in making clear a somewhat abstruse literal subject. On the other hand, we are aware of a heightened sense of the grandeur lamenting over Saul and Jonathan, says of them: "They were swifter than eagles, they

were stronger than lions." Here his sense of their worth is so keen that he greatly overstates the case, describing them in terms that belong only to another order of beings; this because his emotion has so borne him on.

### The Good Figurative Language.

It is a mistake to suppose that figures of speech are merely decorative and ornamental elements put on for display. Nor are they more natural to educated people and men of letters than to the common and unlearned. They are an even more primitive and spontaneous manner of expression than the literal; reflecting, as they do, the picturing play of imagination, more native to man than the logical powers. Figurative language has advantages over literal both for reader and writer. For the reader it is of advantage because it gives him the benefit of an associated idea more concrete or more intense than the literal, thus calling forth his more vivid realization. For the writer it is of advantage because it enables him to express a hard or subtle idea not only more clearly but in much less space; it enables him also to imply his feeling about some matter without dictating what the reader's emotion shall be. It is a kind of literary shorthand, conveying twice as much thought in the same space, thus economizing attention; and a literary tonic, using as it does twice as vivid terms and forms.

**Note.**—It follows from this that figurative language is especially adapted to the more inward and abstract ideas, which need to be reduced from hard logical processes to the picturing terms of sense perception. Thus, when Tenneyson wants to describe the subtle idea of the manifold meanings of poetry, he puts it: "Poetry is like shot-alik with many glancing colors. Every reader must find his own perception according to his ability, and according to his sympathy with the poet." Here the simile both shortens and vivifies the whole description.

**The Most Commonly Used Figures.**—It is not our practice here to make a minute list or analysis of the various figures of speech. It will be better to classify the most commonly occurring ones, reduce them to principle as the connoting idea is related to the literal, and refer them in each class to certain salient types.

As intimated in the paragraph of "Definition" figures fall into the two broad classes of *illustrative* and *emotional*; and as several figures in each class may be mere variants of one essential principle, they are best grouped according to types. **Illustrative.**—In this class, which comprises the forms most commonly recognized as figurative, the connoted idea is introduced merely for its interpretative and clarifying value; that is, the literal idea is associated with something more concrete, or better known, or more directly present to the senses. Three types may be named.

**Figures of the Similitude Type.**—In this type of figures the writer's effort is made purely illustrative; he is concerned with showing how in some point the literal idea resembles something which in other respects is totally different. Note that it is the general difference of class between the literal and the connoted idea which makes the figure; comparison of things in the same class is not figurative at all, but literal.

**Simile.**—When the idea to be illustrated is relatively simple it is said or assumed to be like something else; the word simile being just the Latin adjective *similis*, *simile*, like. Generally the comparing term, *like*, *as*, *so*, *resembles*, is expressed, though this is not essential.

**Example.**—The figures from Macaulay and Tenneyson are similes; the way in which they

apply the connoted idea to the literal explains itself. The following is a plain and telling simile from Abraham Lincoln: "Once let slavery get planted in a locality, by ever so weak or doubtful a title, and in ever so small numbers, and it is *like the Covered Walk or Bermuda grass*—you cannot root it out."

**Analogy.**—But the idea that need figurative illustration is not always so simple; they involve complex relations and principles that need to be brought out into the open, where the whole can be seen. Hence the simile can be used only so far as the idea deepened; it becomes not so much a likeness of things as a likeness of relations; one thing is represented as working in its sphere as does some other thing in its sphere. This deepening of the likeness, less picturesque perhaps but more charged with thought, is called *analogy*.

**Example.**—Abraham Lincoln's well-known illustration of the divided house is an analogy. Its point is not that the state is like a house, but that the state in a certain condition is like a house in an analogous condition. "A house divided against itself cannot stand. I believe this government cannot endure permanently half slave and half free. I do not expect the house to fall—but I do expect it will cease to be divided." A very familiar analogy is that between an argument and a chain, as a chain is no stronger than its weakest link, so an argument is no stronger than its weakest premise. Analogy is probably the most widely useful of all the figures of the simile type.

**Parable.**—In this figure the analogy is carried out in detail, in the form of a story or an extended description, so that not merely one but several elements of the connoted idea are made to convey a meaning and lesson. It is an analogy elaborated into a parallel case in need of the familiar objects or events are displayed in like relations.

**Example.**—The parables of the bible, especially in the teachings of Jesus, furnish the most perfect examples of this figure. A whole series of such parables are given in the gospel to explaining the real inwardness of the kingdom of heaven, in many aspects and relations. The following is one of his shortest parables: "The kingdom of heaven is like unto leaven, which a woman took, and hid in three measures of meal, till it was all leavened." In other parables he represented it as "like unto a grain of mustard seed," as "like unto a man that is a merchant seeking goodly pearls"; as "like unto a treasure hidden in the field," etc. (R. V.); and by such parables he revolutionized men's ideas of what the kingdom of heaven essentially is.

**Figures of the Identity Type.**—This type comprises the figures wherein the similitude is not expressed, but implicit; that is, the connoted idea is not likened to the literal, but squarely identified with it. By this type of figures the writer assumes that one thing is put more directly in position to think the matter out for himself.

**Metaphor.**—In this figure the type is embodied most plainly, the other figures being in fact merely aspects or enlargements of this. Instead of saying one thing is like another, it says, or assumes that one thing is the other. The word metaphor means a transfer; that is, of meanings.

**Example.**—In the following, from Chesterton, the literal idea conveyed is that men have many different ways of communicating ideas to each other: "In the words: 'In the last resort all men talk by signs. To talk by statues is to talk by signs; to talk by cities is to talk by signs. Pillars, palaces, cathedrals, temples, are all enormous dumb alphabet; as if some giant held up his fingers of stone.'" Here, it will be noted, the figure is finished by a kind of simile (as if, etc.). Metaphor, simile, in fact, often intersect with each other.

**Trope.**—This figure is merely metaphor in its most condensed and least obtrusive form.

The word, derived from a Greek word meaning to turn, denotes a word turned from its literal meaning to connote some figurative idea. *Trope* is by far the most frequent and spontaneous figure of all; all language, in fact, that has vigor and life in it will be found to denote its interest in large part from the words of metaphorical suggestiveness that it contains.

**Examples.**—Thus, to speak of a man's character as *warped*, or *twisted*, or *unbalanced*; of his disposition as *sunny* or *sour*; to speak of one as an *old-rummed man*, or as having intellectual *poise*, or as standing *four-square* to all the *wind* that *blows*, is to use the perfectly natural yet vigorous language of trope. Men are frequently using the vocabulary of their business or occupation in this accommodated sense, as when a person's sincerity of conduct is described as *straight goods*, or when a man who fulfills his promises is said to *deliver the goods*. A certain Cape Cod skipper once described an untrustworthy man's character by saying that "his center-board was crooked"; a farmer would perhaps have said that "you could not hitch to him." Stevenson describes the endeavors made by a certain community to dispossess a supposed haunted house of its infernal occupant: "Every kind of spiritual disincantment was put in requisition." (R. V.) When we speak of "improving the moral tone," we are employing the language of music for a more abstract idea.

**Personification.**—This is a form of metaphor in which the literal idea is conceived as a person, having something of the life and traits of personality; thus the idea is made to think, and act, in if alive. A very powerful figure, rightly used; its abuse consists in employing it idly or insincerely.

**Examples.**—Instead of enumerating the noble qualities with which a man was endowed by nature, Shakespeare puts the thought in far more vigorous form by making nature speak: "His life was gentle; and the elements So mix'd in him, that Nature might stand up And say to all the world, 'This was a man!'" Personification is fully at work here in the form of personal touches, a kind of trope, as for instance: "Ideas have hands and feet, as Hegel said, and move the world," where the metaphorical attributes of personhood in members is sufficient to suggest the life that inheres in personality.

**Allegory.**—This figure expands and carries out the metaphor, much as parable expands the similitude; only, instead of blending the literal and connoted ideas, it gives merely the connoted idea, in the form of a narrative or description, and leaves the reader to make out the literal meaning for himself. It is much used as a vehicle for moral or spiritual truth.

**Example.**—It is a mistake to deem allegory an obsolete form, or to associate it only with its great literary example, the thought of *Pierre's Progress*, or Spenser's *Faerie Queene*. Its principle can be seen equally well in a shorter example, such as the following, from a German source: "A man had a plain strong-bow with which he could shoot far and true. He loved his bow so well that he would needs have it curiously carved by a cunning workman. It was done; and at the first trial the bow snapped." Here a bow is made into a man; it is made for a second meaning of it; yet the reader cannot help getting a moral lesson from it. Another example employs the kindred figure called *emblem*, in which animals are endowed with personality: "An old ruinous tower; which had harbored innumerable jackdaws, sparrows, and bats, was at length repaired. When the masons left it, the jackdaws, sparrows, and bats, which were all of their old dwellings, and there were all filled up. 'Of what use now is this great building?' said they: 'come, let us forsake this useless stone-house!'" The figure is alluring, facile, apologetic, and parable are closely akin to each other, and frequently so run together that a minute distinction between them is impractical.

**Figures of the Selective Type.**—In this type of figures the connoted idea, instead of being taken from some alien class of objects, is selected from the class to which the literal idea belongs; that is, the part or accompaniment which is immediately concerned in the action—the business part so to say—is used, and the rest is left out or taken for granted. Thus the reader's attention is concentrated and economized. Two figures, alike in principle, belong to this type.

**Synecdoche.**—This figure takes a part for the whole, or, less often the whole for a part, and makes it do the work of the whole idea. The figurative suggestion may be conveyed either by the noun or the verb, as best serves the writer's purpose.

**Examples.**—1. A part for the whole. This is very common in the language of business or labor; as when we say so many *hands* for work in the field; so many *spades* for digging; so many *spindles* in a factory; so many *rifles* in the army; so many *sail*, or *hulls*, in a fleet. "Every eye shall see him; with fire and sword;" "sound as if some fair city were one voice," are synecdoches. 2. This is seen in the use of such a term as the *administration* for the persons in power. "That I may make thee an *assaultment*, and the inhabitants thereof a *slaughter*," is a Scripture synecdoche, the effect or result, as a whole, put for the cause of it. 3. "Coleridge sat on the brow of Highgate hill in those days," is a synecdoche conveyed by the verb; it is Carlyle's way of saying that Coleridge resided in Highgate at a certain period of his life, which (also by synecdoche) he designates as "those days."

**Metonymy.**—In this figure not a part stands for the whole, but the aspect or accompaniment or result of the idea which has most direct significance for the thought conveyed is selected to do the work. The word metonymy means a transfer of terms.

**Examples.**—In "The bright death quivered at the victim's throat," Tennyson is speaking of a sacrifice. In "the wine has drunk up the thriving business like a bottle of sherry," Stevenson names the result of a life of dissipation. "The pen is mightier than the sword," the moral instrument for what they produce: literature and war.

**Emotional.**—In this class of figures the connoted idea is not a definite image called up from a different class of objects, but rather a state of mind belonging to a different level of feeling: an emotion of wonder, or intense realization, or humor, or contempt, which draws the reader out of his ordinary placid mood to some degree of its own intensity. This emotional state is brought about not directly, but by assuming the manner of expression peculiar to such connoted mood and trusting to the reader's sympathy to share in it. Two types of this class of figures may be distinguished.

**Figures of the Intensity Type.**—In this type of figure the writer's feeling is heightened by his sense of the greatness or importance or deep meaning of his idea, and his manner of setting it forth corresponds. Of this type of emotional figures the most representative are:

**Exclamation.** which is simply an outburst of wonder, or exultation, generally expressed by an elliptical form of the sentence, in which the thought is not formally stated by an indicative verb, but held up, as it were, for contemplation and wonder. In cases where the thought is stated in full grammatical structure there is intensity enough in the context to support the emotion, which then is indicated merely by the mark of exclamation (!). The utterance of the emotion is often aided also by interjectional words.

**Examples.**—Hamlet's expression of wonder at the greatness of man is a very pure example of the figure: "What a piece of work is a man!

how noble in reason; how infinite in faculty in form and moving; how express and admirable in action; how like an angel in apprehension; how like a god!—Sitting as the figure is, the right use of exclamation is a delicate mark of literary skill. Especially, if the writer marks his emotion merely by an exclamation point, he must judge accurately if the emotional value of his context warrants it; and, if he ventures on the support of interjections, he needs to guard against giving the impression of forcing the emotional note.

**Interrogation.**—A figure used principally in oratory and animated argument, is the asking of a question, not in order to elicit an answer, but to imply strongly the opposite of what is asked. It connotes a conviction so strong that the truth of it cannot be gainsaid; it is thus a kind of challenge.

**Examples.**—In the following, from one of Burke's speeches, it can be felt how he is asking questions: not to get an answer, as if it were something yet to be investigated, but as indignantly challenging his hearers to make any other answer than is implied: "What! Gentlemen, was I not to foresee, or, foreseeing was I not to endeavor to save you from all these horrors, mischiefs and disgraces? Was I an Irishman on that day that I boldly withstood our pride? or on that day that I hung down my head, and wept in shame and silence over the humiliation of Great Britain? I became unpopular in England for the one, and in Ireland for the other. What then? What obligation lay on me to be popular?"

**Apotrophe.**—This figure is an address to some absent or distant object as if it were present and could hear and respond; it connotes the fervor of intense realization. Thus, with the connoted idea, is conveyed emotionally the beauty or pathos of the thought.

**Examples.**—In the following, Stevenson, filled with the vivid realization of the truth that men follow ceaselessly after vague ideals, and never attain them, breaks forth into this fervid address to them: "'O toiling hands of mortals! how many mischiefs and disgraces you know not whither! Soon, soon, it seems to you, you must come forth on some conspicuous hilltop, and but a little way further, against the sky, the great spires of El Dorado.'" The intensity of the apotrophe, it will be noted, is supported by exclamation. Note also this exclamation, "toiling hands," "unwearied feet."

**Figures of the Anlmus Type.**—In this type, as in the previous, there is a degree of intensity in the emotion; but the controlling element is the *kind* or direction of the emotion; it reveals how the writer would have his reader feel, in a sense of sublimity or of humor or of the absurd, toward the idea thus set forth—in other words, a certain *anlmus* toward it.

**Hyperbole.**—This is simply overstatement; describing a thing in terms so beyond all reasonable or possible bounds that the reader cannot be misled into understanding it literally; he adjusts the statement to fact, rather, in the spirit of it.

**Examples.**—The figure hyperbole, which is essentially a descriptive figure, actually to have had an interesting history. In the old times men used hyperbole because they could not set bounds to their own imagination; as when the Hebrews went out to explore the Canaan, reported that the cities of that land were "fortified up to heaven," and of the inhabitants: "we were in our own sight as grasshoppers, and so we were in their sight." Of the same army also it is said: "The children of the east lay along the valley like locusts for multitudes; and their camels were without number, and the sand which is upon the sea-shore." (R. V.) In modern times, however, it is used rather to induce in the reader an unbounded imagination, describing in exaggerated terms so that he will not try to measure or to number, but

simply surrender himself to an impression; as when an old-fashioned tattle is described by Hawthorne as "exhibiting as many feet as a centipede," or as when, describing an astonishing run in a violin passage, a nonmusical man avers that the performer played "more than a million notes."

One can produce much the same effect as in hyperbole by a studied *understatement*, an exaggeration in reverse; and this may be regarded as a kind of transition to the next figure.

**Irony.**—In this figure the writer's animus is so strong, and the real state of the case so obvious, that he says or assumes the exact opposite, in the certitude that his meaning will be taken as it is. It connotes various degrees of contempt, or resentment, or indignation, or ridicule. Being mainly a vituperative figure, it is best employed in a tone of playfulness and lightness, else the writer may injure his case by seeming morose and cynical.

**Examples.**—When Job says to his friends, in whose arguments he has discovered a fallacy: "No doubt but ye are the people, and wisdom shall die with you," we can feel the contempt with which he estimates their mental powers and conclusions. When Macaulay, describing a man whose character he detests, begins, "It may well be conceived that, at such a time, such a nature as that of Marlborough would print in the very luxury of lassness," the word *luxury* apprises us that he is putting his conduct in ironical terms; and he goes on to say, "Least his admirers should be able to say at the time of the Revolution he had betrayed his King from any other than selfish motives, he proceeded to betray his country." Here the animus is unrelieved by any lightness of touch; it is pure vituperation. Short handling of one's enemies does not make friends.

The figure *Irony* has many forms and degrees of intensity; giving rise to a whole class of kindred figures: from *Intuendo*, which conveys the ironical suggestion by light hints and touches; through *Satire*, which makes its way by the general ironical or disparaging tone of the writing; to *Invective*, which lets loose the indignant animus in undisguised and scathing terms. On the whole, irony is a rather dangerous figure; if much employed, it is apt to react on the writer's own disposition, or at best to misrepresent his character, especially to unsuitable readers.

**How Not To Do It.**—Figures are a wonderful means of giving life and vigor to

one's language, spoken or written; and probably all can think in figurative terms when the copy is set them by copyist; but not all are equally capable, and perhaps only the few, comparatively speaking, can originate a telling figurative style. It is here that the main caution—how not to do it—lies. Figures are not things to be manufactured in cold blood; they are essentially an appeal to the imagination; and it requires an active and controlled imagination, on the part of the writer, to employ them to their true purpose, or rightly to utilize the figurative language already current; for the language both of literature and of daily intercourse is as full of figure as it can be—figure full of pristine power for those whose minds are ready to apprehend it. The principal misuse or abuse of figures, in both prose and verse, comes from the prevalent tendency not to use them with thought and realization—not to keep them alive. The tendency may be noted in three ways.

**Dead Figures.**—Everything that is used becomes worn, and the more commonly it is worn the faster it wears out. Figures that to begin with were full of life and "go," become dead. The language is as thickly covered with dead figures as with green ones; and the use of slang in the current speech and journalism, from year to year, witness the use and decline of figurative expressions, telling tropes and phrases, which have their day, and either pass into the permanent fund of the language or lose their usage altogether. This is the main source of what is called slang. As to the use of slang, the caution is not against using it—everybody uses it more or less freely while it is alive—but against using it as a substitute for your own thinking, and without realizing that it is slang. To do that is to go on using a dead figure; and like all dead things, if kept too long above ground, its odor is so strong that of course this does not apply to coarse and dirty slang; to use that is malodorous from the start; it is of a piece with coarse and dirty manners.

**Mixed Figures.**—The caution that first rises in most people's minds is against mixing your metaphors so as to form an incongruous and ludicrous image of the whole idea. It comes from employing figures that have become so worn that the

image contained in them is not realized as an image, but only as literal; in other words, from not keeping your imagination active. As a result, the figures of various kinds are constantly mixed together in good and skillful usage; the passage may be a tissue of combined figures, each one doing its fitting work. It is only the incongruous mixture that is to be shunned; and this means simply that slipshod and heedless thinking is to be shunned, which, in fact, "goes without saying."

**Examples.**—"Gives under the yoke." 1. When Stevenson, speaking of certain suburban resorts in the vicinity of Edinburgh, says, "There are places that still smell of the plough in memory's nostrils," he is mixing three figures together: trope or metaphor (*smell*), metonymy (*plough*, for *farm usage*), and personification (*memory's nostrils*, as if memory were a person); and all the figures are alive. 2. When, however, a rustic preacher says "The Gospel ship is sailing on, full-laden and well-rigged, and will continue to sail and prosper, because it is founded on a rock," he is using two figures: the ship and the rock, and were both true; but the mixture of them makes an incongruous idea, the two members annulling each other. The literal of each idea is true, and it is the literal that he is thinking of; the figurative, long current in the religious vocabulary, has become worn and dim.

**Insincere Figures.**—The insincere use of figures rises from the mistaken notion that the figure itself, as a device and a trick, rather than the value of the thought and the honest conviction of the man, is to be relied on for the desired effect. Every figure, indeed, employed heedlessly, a counter as it were instead of a coin, is to some extent an insincere figure, because the man's mind is not in it; this needs no caution, however, its effect being merely futile. The main caution, however, applies to the emotional figures. To try to raise a tempest of emotion, by explanation or interrogation or apostrophe, when there is no true feeling to warrant it, has the effect of bombast, or what is popularly called "highfalutin." To indulge in hyperbole when the literal idea is an insignificant net value, is to betray either an unbalanced imagination or a desire to play on the reader's realizing powers beyond the warrant. There is nothing for it, after all, in the use of figurative language, but to keep your thoughts about you, your imagination active, and your aim sincere.

## DICTIONARY OF ROMONYMS

WORDS HAVING THE SAME OR NEARLY THE SAME SOUND, BUT DIFFERENT IN SPELLING AND MEANING

- |   |  |  |                              |
|---|--|--|------------------------------|
| a. Adda, join                                     | a. Badio, did                              | a. Berry, a small fruit                      | a. Cannott, an engine of war |
| a. Add, an oz                                     | a. Bail, a servant                         | a. Bury, about                               | a. Canan, a lake or river    |
| a. All, to be ill                                 | a. Bala, a bundle of goods                 | a. Birth, coming into life                   | a. Canan, a church dignitary |
| a. All, add up                                    | a. Bala, a dance-entertainment             | a. Birth, office or situation, on board ship | a. Cash, a vessel            |
| a. All, one of the elements                       | a. Ball, a round body                      | a. Blow, did blow                            | a. Cash, a caque, a helmet   |
| adv. Ere, before                                  | a. Bawl, to speak very loud                | a. Blot, a color                             | a. Cast, to throw            |
| adv. Er, over                                     | a. Baw, an animal                          | a. Blot, a color                             | a. Cast, to throw            |
| a. Heir, interior                                 | a. Bear, to carry                          | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. All, every one                                 | a. Bear, dog's cry                         | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. All, a sharp tool                              | a. Bear, outer rind of a tree              | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Altar, a raised structure for divine offerings | a. Barque, kind of ship                    | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Altar, to make different                       | a. Base, the lower part                    | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Analyst, one who analyzes                      | a. Base, the lower part of a stump         | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Analyst, order of animals                      | a. Base, to lower (one's price)            | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Anchor, of a ship                              | a. Bait, an allurement                     | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Anker, a liquid measure                        | a. Bait, to prepare or offer an allurement | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Ant, an insect                                 | a. Bait, to lower (one's price)            | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Aunt, a father's or mother's sister            | a. Bait, an allurement                     | a. Bore, to make a hole                      | a. Cede, to give up          |
| prefix. Ante, before                              | a. Bait, to prepare or offer an allurement | a. Bore, to make a hole                      | a. Cede, to give up          |
| prefix. Anti, against                             | a. Bait, to lower (one's price)            | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Ate, part of a circle                          | a. Bait, an allurement                     | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Ark, a chest; a large floating vessel          | a. Bait, to prepare or offer an allurement | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Ascend, going up; rising ground                | a. Bait, to lower (one's price)            | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Ascent, ascent (noun)                          | a. Bait, an allurement                     | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Ate, did not                                   | a. Bait, to prepare or offer an allurement | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Aught, twice four                              | a. Bait, to lower (one's price)            | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Auger, a boring tool                           | a. Bait, an allurement                     | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Auger, a sawtooth                              | a. Bait, to prepare or offer an allurement | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Aught, anything                                | a. Bait, to lower (one's price)            | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Aught, a thousand                              | a. Bait, an allurement                     | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. August, name of a month                        | a. Bait, to prepare or offer an allurement | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. August, noble                                  | a. Bait, to lower (one's price)            | a. Bore, to make a hole                      | a. Cede, to give up          |
| a. Bad, not good                                  | a. Bait, an allurement                     | a. Bore, to make a hole                      | a. Cede, to give up          |

- [illegible]



**Die with, from.**—Invalids do not die with, nor from but of, a disease.

**Die from, with.**—One thing differs from another as appearance; one person differs with another in opinion.

**Direly.**—Not to be used in the sense of as soon as, but only as "Direly they came we left," but "We left directly" is correct.

**Disseminate.**—Provisional for *propagate*, and should not be used.

**Donate.**—An unauthorized formation from *donation*. Better say "I have donated."

**Don't for doesn't.**—Don't is the plural contraction of do not, therefore such common expressions as "He don't live here," "She don't like to sing," etc., are ungrammatical.

**Don't think.**—Instead of saying "I don't think it will rain," it is better to say, "I think it will not rain."

**Double negative.**—Double negatives in English are universally common but incorrect. Avoid such words as "I haven't never been there," "I haven't had but one vacation in ten years."

**Due, owing.**—That is which ought to be paid; as, "The note is due next month." *Owing* is used in the sense of on account of; as, "It was owing to his daring that the inscription was checked."

**Dutch for German.**—Do not say Dutch when you refer to German. Dutch refers to Holland.

**Each.**—Each is singular in number, and should be used with a singular noun and verb. Do not say "Each comes in their turn," but "Each comes in his turn," not "Each man were singled out," but "Each man was singled out."

**Elegant.**—Elegant means refined, of good taste. A man misused and much overused word.

**Else.**—This form is not justified by good usage. Else, by preponderance of custom, when *else* joined to *anaphora*, *emphatic*, *any one*, or *some one*, forms a possessive, the *s* is dropped, and *else* remains. Many, however, prefer to write the form *some else*.

**Emigrant, immigrant.**—These two words are often confused. *Emigrants* are people going out of a country; *immigrants* are people coming into a country.

**Endere or Indere.**—Do not say "Endere for the back of," but "Indere for the back of." *Indere* is the spelling now generally preferred.

**Enjoy.**—Poor fiction for this expression, should be avoided; no one really enjoys poor health.

**Enthusie.**—A verbal form not authorized by good usage. Better say, "I am enthusiastic."

**Equally as well.**—The *as* is not necessary; say, "Equally well."

**Especially.**—Be careful to see that a verb in the singular number follows. "Every man at his post."

**Every one, Everybody, Everything.**—These words, except "every one," should always be preceded by a singular pronoun. "Every one should mind his own business." "Everybody has his troubles."

**Evidence, testimony, proof.**—Evidence is anything that tends to convince; testimony is evidence given by witnesses; proof is whatever establishes the truth of a proposition.

**Except, Unless.**—Except is not to be used for unless. Do not say "Except I am delayed, I shall arrive at three," but "Unless I am delayed," etc.

**Existing truths.**—Existing truths should always be expressed in the present tense. Do not say "Galileo taught that the world was round," but "It is round."

**Expect.**—Expect refers only to the future, and is not to be used for think or suppose. Do not say "I expect I was there," "I expect you had a pleasant time yesterday."

**Farther, Further.**—Farther refers to linear distance. "We had gone farther than I supposed." Further measures quantity or degree, as, "I shall speak further on the question."

**Fellow.**—Not correctly used for woman. Fellow is used in a few cases, but of different meanings. "Few persons like Mr. Jones' means that he is generally disliked. A few persons like him" means some, and perhaps all who know him.

**Firstly.**—Not an approved form. First is both an adjective and adverb.

**First-rate.**—Correctly used as an adjective. "He has a first-rate place," but not "He did first-rate."

**Former, latter.**—The former refers to the first of two things, the latter to the second. "He stopped to get the machine." "He stopped to get the former rule" or "the latter member."

**For is.**—Do not say "I went for to see the show." It is superfluous.

**Funny.**—The word should not be used to mean strange or curious.

**Gesture.**—This word should never be used. *Gesticulate*—Not to be used as a verb. Do not say "The speaker gesticulated frequently." Say, rather, "He gesticulated."

**Get.**—Strictly, *get* means to obtain by voluntary effort. It does not signify mere possession. Do not say "I haven't got my rest," but "I haven't a rest." *Get* is also preferred by good writers to *get in* such expressions as "We had got in from our illness."

**Get over.**—Often incorrectly used for *survive* or to *survive*.

*reover*, as "He got over the disease," or "He got over a fact," meaning to *revert* it.

**Get to go.**—This expression is common in some parts of the country but should not be used. "I was unable to go," or "I was prevented from going," rather than "I didn't get to go."

**Good.**—This word is used in many incorrect expressions. "I have walked a good deal," "The boy looked about a good deal better than sleep."

**Good night.**—Do not say "Good night" as an adverb. Do not say "You sang good." "Did you sleep good last night?" In these cases *well* should be used. *Good* is used in the sense of *well* as in "The United States to mean think, as in 'I guess you are right' for 'I think.'"

**Had out.**—A provincial and incorrect. *Had* or any form of the verb *to have* cannot correctly be used as an auxiliary with *ought*. Use *should* or *ought* but not "He *hadn't* ought to have gone," but "He *should* not have gone."

**Hang.**—A vulgarism. There is no such contraction for *have not* or *has not*.

**Hang, Hanged.**—The verb *hang* has two forms for the past participle, *hanged* and *hung*. *Hanged* is used for persons, *hung* for other objects. "The man was hanged." "The coat was hung on the rack."

**Health.**—*Healthful*. That is *healthy* which is in good health; that is *healthful* which promotes health. The family was in a *healthy* condition, but the child had been living on *healthful* food.

**How.**—*How* is not to be used for *what* nor for "What do you say?"

**Human.**—Not to be used as a noun. Do not say "The house was not fit for humans to live in."

**Idea.**—Not to be used in the sense of *percept* or *beautiful*; it properly means that which exists in the mind. "His ideas are high."

**If I was.**—Use *was* instead of *were* in all cases where the conditions are contrary to fact. "If I were you, I would do it." "If I were a man, I should practice law."

**I'm not sure.**—Use the indicative in cases of uncertainty. "If I were you, I did not do it." "I did not do it, I am uncertain as to whether I was or not."

**Illy.**—Should be avoided; it is the proper word, but not a positive and adverb. "He did the work very illy."

**In, into.**—Use *in* to signify rest in a place; use *into* to signify motion into a place. "He was standing with his hands in his pockets." "I put my hands into my pockets." I came in an attitude of *in* to the door of his office."

**Inaugurate.**—The word means to induce into office or to make a ceremonious beginning. It is not to be used in the simple sense of *begin*.

**Individual.**—The word should not be used in the mere sense of *person*. The word is correctly used in "Chemical bodies are individual." Do not say "Individual, cleft." The *cleft* or *split* signifies that the individual is with an adverb between the two words.

**Initiate.**—The word ought not to be used simply for *begin*. The word suggests ceremonious initiation. "The candidates were initiated into the lodge."

**In our midst.**—The possessive case is not to be used, but rather a construction with *of*; as, "In the midst of us."

**Invite.**—Not to be used as a noun. Do not say "I received an invite," but "I received an invitation."

**Kind of a.**—This is superfluous.

**Lady.**—This word is not to be used for *wife*, or to mean simply *woman*.

**Learn, Teach.**—These words are often vulgarly misused. *To learn* is to receive instruction; *to teach* is to give instruction. "I can learn if you will teach me."

**Lead.**—*Lead* is a verb; from a noun. I lend a man a dollar, and he receives the loan.

**Less, Fewer.**—*Less* has to do with amount or quantity, and *fewer* with numbers. "He had less money and fewer clothes than he needed."

**Let.**—Requires the objective case. "Let him with his gun." Not "Let he and I."

**Like.**—See *As*.

**Lie, Lay.**—See *Verb*. These verbs have been so confounded as to deserve some notice. *To lie* is to recline, and designates a state; *to lay* is to act, and denotes an action on an object. It is properly to cause to *lie*. "A thing lies on the table." "Some one *lays* on the table." "He lies with his father." "They *lay* him with his fathers." In the same manner, when used idiomatically, we say, "I *lie* thing here by us," and "I *lay* it into use." "We *lay* it by for some future purpose."

**Lie, Lay.**—The confusion arises probably from the fact that *lay* appears in both verbs. The words are correctly used in the following sentences: "I lay myself upon the bed (action). I lay upon the bed (rest)."

**Lie, Lay.**—I laid myself upon the bed (action). I have lain upon the bed (rest). "I have laid an egg (action). A ship lies at the wharf (rest)."

**Lie, Lay.**—The murdered Lincoln lay in state (rest); The crowd lay on the relief (action).

**Like, As.**—*Like* has a prepositional use, but as a conjunction, it is not to be used.

**Like, As.**—Do not say "It looks like it was caused by fire," but "It looks *as if*," etc. The following are correct: "My brother looks like me," "He acted as if he were insane." "Do it as I do."

**Likely.**—See *As*.

**Limb.**—Do not use *limb* when you mean *leg*. *Limb* may be applied to any member, and it is not more modest than *leg*. "The woman had her leg broken."

**Lit.**—Not to be used for *lighted*. Instead of saying "He lit the gas," say "He lighted the gas." Do not say "He lit on his feet," but "he lighted on his feet."

**Locate.**—This word should not be used in the sense of *settle* or *locate*, inactively, to mean to sit or place in a position; as, "He located a claim."

**Lot, Lots.**—Very inelegantly used for a great many things. Do not say "He had a lot of money left him;" "She looks a lot like her brother." The word means a distinct part or portion. "He divided his goods into lots."

**Launch.**—An authorized form both as noun and verb, but not considered so elegant as a noun as *launch*.

**Mad.**—Should not be used for *angry*. As a noun as *madness*.

**Mail man.**—An inelegant form for *postman*.

**Me being.**—Do not say "He did not know of me being there." The possessive case is required. "He did not know of my being there." "There is little chance of my being there."

**Monstrous.**—*Monstrous* means abnormal or deformed. Not to be used for *large* or *immense*; as, "It was a monstrous man."

**Most.**—Not to be used for *almost*; as "He is here most every day."

**Mutual.**—Not to be used to mean common, but reciprocal. "We may have a common friend, but a mutual dislike." That is, a dislike for each other.

**Myself.**—Do not use *myself* for *me*. Do not say "John and myself are friends;" but "John and I," etc.

**Near.**—Not to be used for *nearby*. Say "He was not nearly so unamiable as his brother." Instead of "Not so very unamiable."

**Nearly.**—Should not be used as an adjective. We may say "The house is nearly," but not "A nearly house."

**New beginner.**—Omit the *new*; all beginners are new.

**Nice.**—A very generally misused word. Properly *nice* means delicate, discriminating, fastidious. It is little used in the sense of *pleasant*.

**Not as.**—Do not use *not as* to mean *as*. "The man may be nice in his manners. The word should not be used to mean *aggressive* or *charming*," as "I had not as nice a man."

**Nicely.**—Do not use *nicely* for *well*. As "The sick man is doing nicely."

**Not as.**—Do not use *not as* to mean *as*. "The man is doing nicely."

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Derive from	Feed on, upon	Mingle with	Release from <sup>b</sup>
Derogate from	Fight with, against, for	Minister to	Relieve from
Derogation from	Filled with, against, for	Mislead	Relish for, of, (gives r.) to (food)
Derogatory to	Fond of	Mix with	Rely on, upon
Descended from	Fondness for	Necessary to, for	Remain in, of
Deserve of	Foreign to, from	Need of	Remark on, upon
Desirous of	Founded on, upon, in (truth)	Neglectful of	Remit to
Desist from	Free from or of (faults), of (the city of London), with (money), in (society), for (all), to (all)	Negotiate with	Remonstrate with (a person), against (a thing), for (doing)
Desist of	Friend to	Observe of	Remove from
Desist of, for	Frightened at	Observation of	Rispet of
Desist from	Frown at, upon	Obtrude on, upon	Rispet with
Desist from	Fruitful in, of	Obvious to	Respect on, upon
Desist on, upon	Furnish with	Offer to	Respectful to
Desist to	Give to	Operate on	Resemblance to, between
Die of (disease), by (sword, famine), for (love, or for some cause)	Glad of, at, with	Opposite to	Resolve on, upon
Die with (a person) in (opinion), from (a person or thing), in (some quality)	Glance at, upon, from, to	Overwhelmed with, by	Rest in, at, on, upon
Diffidence between (things), in (quality, etc.); on (questions)	Good with	Parley with	Rest to, from
Difficult (to a person) in (opinion), from (a person or thing), in (some quality)	Grateful to (a person), for (a favor)	Part from, with	Restrain from
Diffidence between (things), in (quality, etc.); on (questions)	Grieve at, for	Partake of	Return to, from
Difficult (to a person) in (opinion), from (a person or thing), in (some quality)	Guard against	Partial to	Rid of
Diminution of	Hanker after, for	Partiality to, for	Rob of
Diminished from, by	Happen to, on	Participate in, of (formerly)	Rove about, over, in
Diminished from, by	Head of	Patient with, of, under, toward	Rub against
Disagree with, to, from; in (opinion), in or with (a thing obtained), in or with (a thing obtained)	Hinder from	Pay for	Rule over
Disapprove of	Hiss at	Persuade to	Rush against, on, upon
Disapprove of	Hiss at, against, of, from, for, to, ignorant of	Penetrate into, through	Said with
Disapprove of	Immersion in	Pertain to	Saltate with
Disapprove of	Impatient at, for, of	Pitch upon, on	Saturate with
Disapprove of	Impetuous to	Play on, upon, with	Save from
Disapprove of	Inconspicuous on, upon	Pleasant to	Seek for, after, to
Disapprove of	Inconspicuous on, upon	Pleasant to	Seize on, upon
Disapprove of	Inconspicuous on, upon	Pleasant to	Send to, for
Disapprove of	Inconspicuous on, upon	Pleasant to	Sensible of
Disapprove of	Inconspicuous on, upon	Pleasant to	Significant to, of
Disapprove of	Inconspicuous on, upon	Pleasant to	Similar to
Disapprove of	Inconspicuous on, upon	Pleasant to	Sink into, in, beneath
Disapprove of	Inconspicuous on, upon	Pleasant to	Sit on, upon, in
Disapprove of	Inconspicuous on, upon	Pleasant to	Skiffish in, at, of
Disapprove of	Inconspicuous on, upon	Pleasant to	Smile at, on, upon
Disapprove of	Inconspicuous on, upon	Pleasant to	Snip at
Disapprove of	Inconspicuous on, upon	Pleasant to	Snatch at
Disapprove of	Inconspicuous on, upon	Pleasant to	Sneeze at
Disapprove of	Inconspicuous on, upon	Pleasant to	Solicit about, for
Disapprove of	Inconspicuous on, upon	Pleasant to	Sorry for
Disapprove of	Inconspicuous on, upon	Pleasant to	Stay in, at, with
Disapprove of	Inconspicuous on, upon	Pleasant to	Stick to, by
Disapprove of	Inconspicuous on, upon	Pleasant to	Strip of
Disapprove of	Inconspicuous on, upon	Pleasant to	Strive with, against, for
Disapprove of	Inconspicuous on, upon	Pleasant to	Subject to
Disapprove of	Inconspicuous on, upon	Pleasant to	Submit to
Disapprove of	Inconspicuous on, upon	Pleasant to	Substitute for
Disapprove of	Inconspicuous on, upon	Pleasant to	Subtract from
Disapprove of	Inconspicuous on, upon	Pleasant to	Suitable to, for
Disapprove of	Inconspicuous on, upon	Pleasant to	Surprised at
Disapprove of	Inconspicuous on, upon	Pleasant to	Suspected of, by
Disapprove of	Inconspicuous on, upon	Pleasant to	Swear from
Disapprove of	Inconspicuous on, upon	Pleasant to	Sympathize with
Disapprove of	Inconspicuous on, upon	Pleasant to	Taste of (a thing possessed), for (a thing desired or related)
Disapprove of	Inconspicuous on, upon	Pleasant to	Tax of, with, for, on, upon
Disapprove of	Inconspicuous on, upon	Pleasant to	Tend to, toward
Disapprove of	Inconspicuous on, upon	Pleasant to	Thankful for
Disapprove of	Inconspicuous on, upon	Pleasant to	Think on, upon, of, about
Disapprove of	Inconspicuous on, upon	Pleasant to	Thirst after, for
Disapprove of	Inconspicuous on, upon	Pleasant to	Tough of, on, upon
Disapprove of	Inconspicuous on, upon	Pleasant to	Transmit to
Disapprove of	Inconspicuous on, upon	Pleasant to	Triumph over
Disapprove of	Inconspicuous on, upon	Pleasant to	Troublesome to
Disapprove of	Inconspicuous on, upon	Pleasant to	True to
Disapprove of	Inconspicuous on, upon	Pleasant to	Trust in, to
Disapprove of	Inconspicuous on, upon	Pleasant to	Unison with
Disapprove of	Inconspicuous on, upon	Pleasant to	Unite with
Disapprove of	Inconspicuous on, upon	Pleasant to	Useful for, to, in
Disapprove of	Inconspicuous on, upon	Pleasant to	Value on, upon
Disapprove of	Inconspicuous on, upon	Pleasant to	Vary in
Disapprove of	Inconspicuous on, upon	Pleasant to	Vary in (a person), with (a thing)
Disapprove of	Inconspicuous on, upon	Pleasant to	Wait on, upon, for, at
Disapprove of	Inconspicuous on, upon	Pleasant to	Want of
Disapprove of	Inconspicuous on, upon	Pleasant to	Wary of
Disapprove of	Inconspicuous on, upon	Pleasant to	Weep at, for
Disapprove of	Inconspicuous on, upon	Pleasant to	Witness of
Disapprove of	Inconspicuous on, upon	Pleasant to	Worthy of
Disapprove of	Inconspicuous on, upon	Pleasant to	Yearn toward, for
Disapprove of	Inconspicuous on, upon	Pleasant to	Yield to
Disapprove of	Inconspicuous on, upon	Pleasant to	Yoke with
Disapprove of	Inconspicuous on, upon	Pleasant to	Zealous for

## DICTIONARY OF ABBREVIATIONS, CONTRACTIONS, AND DEGREES

A. a. Adjective.	Abbr. Abbr. Abbreviated, Abbreviation.	A. D. C. Aide-de-camp.	Apt. Dept. Agricultural Department
A. alto.	Adv. adverb.	Adj. Adjective.	Ag. Agric. Agriculture, Agricultural.
A. ans. Answer.	Abp. Archbishop.	Adj. Adj. Adjutant-General.	Ag. Agent.
A. as. (Lat. ad.) To; et.	A. B. S. American Bible Society.	Adj. Adj. Adj. (Lat. ad. ibidem).	A. H. (Lat. <i>Annus Hægira</i> ) In the year of the Hægira, or flight of Mahomet.
A. as. The like quantity of each. (Used in scientific formulae.)	A. C. Arch-Chancellor.	Adm. Admiral; Admiralty.	A. H. S. (Lat. <i>Annus Humanae Salutis</i> ) In the year of human salvation.
A. A. Associate of Arts.	Acad. Academy.	Adm. Administrator.	A. A. Associate of the Institute of Actuaries.
A. A. A. American Association for Advancement of Science.	A. C. A. American Congregational Association.	Act. Act. (Lat. <i>Actus</i> ) Of age, aged.	A. L. of H. American Legion of Honor.
A. A. G. Assistant Adjutant-General.	Acc. Acc. Accusative.	Act. Act. Associate of the Faculty of Actuaries.	A. L. Alumnum.
A. A. S. S. (Lat. <i>Academia Scientiarum Societas Sæcularis</i> ) Member of the American Antiquarian Society.	A. D. (Lat. <i>Annus Domini</i> ) In the year of our Lord.	A. G. Adj. Gen. Adjutant-General.	A. Alabama.
A. B. (Lat. <i>Artem Barbalaurum</i> ) Bachelor of Arts. [See B. A.]	Ad. ad. Advertisement.	A. G. (Lat. <i>Argentum</i> ) Silver.	A. Alaska Territory.









[illegible][illegible][illegible]

V. Gen. Venerable.  
V-G. Vice-General.  
v. g. (Lat. verbis graeco.) For example.  
V. G. Verbi Intransitive.  
Vice-P. Vice-President.  
Vid. (Lat. Vide.) See.  
Vid. Verb. Imperfect.  
V. irr. Verb irregular.  
V. i. Verb intransitive.  
V. Vic. Vicecount.  
Viz. (Lat. videlicet.) Namely; to wit.  
[Or.]  
V. voc. Verbi neuter.  
Voc. Vocative.  
Vol. Volume.  
Vol. Volumes.  
V-P. Vice-President.  
V. r. Verb reflexive.  
V. r. Verb Very Reverend.  
V. s. (Lat. versus.) Against.  
V. S. Veterinary Surgeon.  
v. t. Verb transitive.  
Vt. Vermont.  
Vul. Vulgate.  
Vul. Vulgar vulgarly.  
v. u. (Lat. vasa lectionis.) Various.  
W. Wednesday; Week; Welsh; West, western.  
Wall. Wallach. Wallachian.  
W. Wall.  
W. W. Water.  
Wash. Washington.  
W. s. Water closet.  
W. C. A. Women's Christian Association.  
W. C. T. U. Women's Christian Temperance Union.  
Wed. Wednesday.  
We. Welsh.  
w. Wrong foot (in printing).  
W. J. Wharf.  
W. I. West Indies, West India.  
W. is. Wisc. Wisconsin.  
W. Lon. West Longitude.  
W. M. William.  
W. M. Worshipful Master.  
W. N. W. West-northwest.  
W. Worship.  
Wor. Worshipful.  
W. S. Writer to the Signet.  
W. S. W. West-southwest.  
W. W. Warrant.  
W. Va. West Virginia.  
Wyo. Wyoming.  
X. Christmas.  
X. m. Xmas. Christmas.  
X. n. Xmas. Christmas.  
X. n. Xmas. Christmas.  
X. p. X. X. Christopher.  
X. n. Christian.  
X. n. Christian.  
Y. Fr. Year.  
Y. Y. Yards.  
Yd. Yards.  
Y. Th. Thee.  
Y. Th. Thee.  
Y. M. C. A. for Anglo-Saxon letter Association.  
Y. M. C. A. Young Men's Christian Association.  
Y. M. H. A. Young Men's Hebrew Association.  
Y. P. S. C. E. Young People's Society of Christian Endeavor.  
Yr. Yours.  
Ys. Years; Yours.  
Y. W. C. A. Young Women's Christian Association.  
Zach. Zachary.  
Zech. Zechariah.  
Zerk. Zerkowian.  
Z. G. Zoo. Zoological Gardens.  
Z. G. Zoo. Zoological Gardens.  
Zoo. Zoodermis, zoedermis.  
Zoo. Zoogeography, zoogeographical.  
Zool. Zoology.

## DICTIONARY OF FOREIGN WORDS AND PHRASES

### 1. FROM THE CLASSIC LANGUAGES

ab *extra*. From without.  
 ab *incunabulis*. From the cradle.  
 ab *initio*. From the beginning.  
 ab *origine*. From the origin; commencement.  
 ab *ovo*. From the egg; from the very beginning.  
 ab *ovo usque ad mala* (lit., "from the egg to the apples"), from the beginning to the end; from infancy, which began with eggs and ended with fruit).  
 ab *extremo*. From beginning to end; from first to last.  
 ab *esse*. From being; from the fact that one will not be the thing). Out of sight, out of mind.  
 ab *est* *invidiis*. Let there be no ill-will; any spite.  
 ab *est* *omni*. From none; from none (judge of the rest). From a single instance infer the whole.  
 ab *urbe condita*. From the building of the city, i. e., from the beginning.  
 a *caelo*, *ex aethere*. From heaven to heel.  
 a *cruce salutis*. Salvation by or from the cross.  
 ab *arbitrio*. At will; at pleasure.  
 ab *extremo*, *ex aratro* *calendis*; *ex a.*, never. The Greeks had no calends.  
 ab *capitulum vulgus*. To attract or please the

**Deo et regi**, From God and the king.  
**ad extremum**, To the extreme; at last.  
**ad gustum**, To one's taste.  
**ad minimum**, Perhaps; to the individual.  
**a die**, From that day.  
**ad interitum**, To extermination.  
**ad libitum**, At pleasure.  
**ad modum**, In the manner of.  
**ad multos annos**, For many years.  
**ad usum**, So as to digest or masticate.  
**ad patres**, Gathered; fathers; dead.  
**ad referendum**, To be further considered.  
**ad rem**, To the purpose; to the point.  
**ad satiem**, gluttony; to glut the soil.  
**ad nūm**, I am present; I am here.  
**ad summum**, To the highest point or amount.  
**ad usumque**, To use and to the use.  
**ad unum omnes**, All to a man.  
**ad utrumque paratus**, Prepared for either event  
 or result.  
**ad vivum**, Like life; to the life.  
**acrescit mendacio**, It becomes worse from the  
 more.

**aequabiliter diligenter**, Equably and diligently  
**aequo animo**, With a calm mind.  
**aequis animis**, (Of his or her age) a  
 fortiori, For the stronger reason.  
**aeque animi**, Do you have reason: Attend to  
 your business.  
**alere flammam**, To feed the flame.  
**alere materiam**, Cherishing (or benign) mother.  
**alter ego**, Another self.  
**alter idem**, Another, exactly similar.  
**alter amicus**, A friend is another self.  
**alterum alterius anulo cingit**, The one needs the  
 assistance of the other.  
**alterum studiis**, To seek more.  
**amantium ira amoris integratio**, Lovers' quarrels  
 are the renewing of love.  
**amicitia ad minima**, From the greatest to the  
 least.  
**amicus humani generis**, A friend of the human  
 race.  
**amicus usque ad aras**, A friend even to the altar  
 [of sacrifice]; i. e., to the last extremity.  
 (See *amicus*.)













ancienne noblesse (d'œ œ nobl's), the old nobility, French families anobbed before the revolution of 1792.  
ancien régime (d'œ œn r'j'm), (the former government or administration), the rulers of the French republication period.  
a outrance (d'œ œ tr'ns), to the last extremity.  
à pas de géant (d'œ œ p's d'j'nt), with a giant's stride.  
peindre (d'œ œ p'ndr), to paint.  
à perte de vue (d'œ œ p'rt d'v), tillout of sight.  
à peu près (d'œ œ p' p'rs), nearly.  
à pied (d'œ œ p' d'), on foot, by the piece.  
à placer (d'œ œ p'p' d'œ œ p' d'), at pleasure.  
à pied (d'œ œ p' d'), on foot, by the piece.  
à plomb (d'œ œ p'l'm), perpendicularly; firmly.  
à point (d'œ œ p'nt), just in time; exactly; exactly right.  
appui (d'œ œ p'p'i), point of support; point of rest.  
à prima vista (d'œ œ p'ri m' v'it'), at the first sight.  
à prix d'or (d'œ œ p'ri d'œ œ), at price of gold, very costly; fetching a fancy price.  
à propos (d'œ œ p' p'p'œ), at the proper time.  
à propos de rien (d'œ œ p' p' d'œ œ r'j'nt), apropos to nothing; not pertinently.  
arc-en-ciel (d'œ œ œ œ œ), rainbow.  
à ras de champagne (d'œ œ r'œ d'œ œ œ œ), even with the ground.  
argent comptant (d'œ œ œ œ œ œ œ), ready money.  
à riveder (d'œ œ œ œ œ d'œ œ), adieu until we meet again.  
à Rome comme à Rome (d'œ œ r'œ œ œ œ œ œ), at Rome do as Rome does.  
arrière pensée (d'œ œ œ œ œ œ), mental reservation; unwavering purpose.  
assignat (d'œ œ œ œ œ), French paper money issued after the revolution at the end of last century.  
atelier (d'œ œ œ œ), a work-shop; studio.  
à tort et à travers (d'œ œ œ œ œ œ œ), at random.  
à toute outrance (d'œ œ œ œ œ œ œ), desperately; tremendously; with a vengeance.  
à tout hasard (d'œ œ œ œ œ œ), at all hazards; at all events.  
à tout prix (d'œ œ œ œ œ), at any price.  
attache (d'œ œ œ œ), an official belonging to an embassy.  
à bon droit (d'œ œ œ œ œ œ), with good reason.  
à bon sens (d'œ œ œ œ œ œ), at the end of his Latin; to the extent of his knowledge.  
au contraire (d'œ œ œ œ œ œ), on the contrary.  
au courant (d'œ œ œ œ œ), fully acquainted with matters.  
au dépeint (d'œ œ œ œ œ œ), in despair.  
au fait (d'œ œ œ œ), to the point.  
au fond (d'œ œ œ œ), to the bottom.  
au wiedersehen (d'œ œ œ œ œ œ œ), till we meet again.  
au levant (d'œ œ œ œ œ), to the east; eastward.  
au pis aller (d'œ œ œ œ œ œ), at the very worst.  
au reste (d'œ œ œ œ œ œ), besides.  
au revoir (d'œ œ œ œ œ œ), till we meet again.  
au sujet dit, au sujet fait (d'œ œ œ œ œ œ œ), no sooner said than done.  
autant d'hommes, autant d'âmes (d'œ œ œ œ œ œ œ), as many men, as many minds.  
auto da fe (d'œ œ œ œ œ œ), a sort of faith; the burning of Jews and heretics.  
autre droit (d'œ œ œ œ œ œ), another right.  
autre fois (d'œ œ œ œ œ œ), another time.  
autre vie (d'œ œ œ œ œ œ), another life.  
aut vincter aut mori (d'œ œ œ œ œ œ œ), victory or death.  
aux armes (d'œ œ œ œ œ), to arms.  
aux prières (d'œ œ œ œ œ œ œ), prayer; Introductory matter.  
avec permission (d'œ œ œ œ œ œ œ), by consent.  
à volonté (d'œ œ œ œ œ œ œ), at will; at pleasure.  
à votre santé (d'œ œ œ œ œ œ œ), to your health.  
à votre santé (d'œ œ œ œ œ œ œ), to your health.  
à votre santé (d'œ œ œ œ œ œ œ), to your health.  
aux champs (d'œ œ œ œ œ œ), a country ball.  
ballon d'essai (d'œ œ œ œ œ œ), a balloon sent up to test the direction of air-currents; hence, a suggestion to gauge public feeling on any question.  
bas bleu (d'œ œ œ œ œ), a blue-stocking; a woman who seeks a reputation for learning.  
beau-ideal (d'œ œ œ œ œ œ), a model of ideal perfection.  
beau monde (d'œ œ œ œ œ œ), the fashionable world.  
beaux esprits (d'œ œ œ œ œ œ), men of wit, or genius.  
beaux yeux (d'œ œ œ œ œ œ), handsome eyes; attractive looks.  
bel esprit (d'œ œ œ œ œ œ), a wit; a genius.  
bel étage (d'œ œ œ œ œ œ), the second story of a house.  
belles-lettres (d'œ œ œ œ œ œ), refined literature.  
benedetto e vizio male che vien solo (d'œ œ œ œ œ œ œ), blessed is the misfortune that comes alone.  
ben-bravé (d'œ œ œ œ œ œ), well invented.  
bon mot (d'œ œ œ œ œ œ), a good word; a bugbear.  
bienvenue (d'œ œ œ œ œ œ œ), good man; welcome; decorum.  
bienvenue (d'œ œ œ œ œ œ œ), welcome.  
bijou (d'œ œ œ œ), a jewel; a treasure.  
bijouterie (d'œ œ œ œ œ œ), jewelry.  
billet doux, or billet d'amour (d'œ œ œ œ œ œ), a love letter.  
billets-d'état (d'œ œ œ œ œ œ), government paper; bank notes.  
blazze (d'œ œ œ œ), odd; gaudy.  
blanc (d'œ œ œ œ), surprised.  
bon ami (d'œ œ œ œ œ), good friend.  
bon bon (d'œ œ œ œ œ), a sweetmeat; confectionery.  
bon diable (d'œ œ œ œ œ), a jolly good fellow.  
bon gré, mal gré (d'œ œ œ œ œ œ), with good or bad grace; willing or unwilling.  
bonhomme (d'œ œ œ œ œ œ), good nature; easy temper; erudition.  
bon jour (d'œ œ œ œ œ œ), good day; good morning.  
bon mal (d'œ œ œ œ œ), a slight cold.  
bonne (d'œ œ œ œ), a nurse.  
bonne-hausche (d'œ œ œ œ œ), a luxurious meal; a toothsome tit-bit.  
bonne et belle (d'œ œ œ œ œ œ), good and handsome (said of a woman).  
bonne foi (d'œ œ œ œ œ), good faith.  
bon goût (d'œ œ œ œ œ œ), good taste.  
bon ton (d'œ œ œ œ œ œ), high fashion; first-class society.  
bon vivant (d'œ œ œ œ œ œ), a good liver; a jolly companion.  
bon voyage (d'œ œ œ œ œ œ), a good journey.  
boutique (d'œ œ œ œ œ), a small private apartment.  
bourgeoisie (d'œ œ œ œ œ œ), the body of citizens; burghs; the shop-keeping class.  
bravé (d'œ œ œ œ œ), patented.  
brusquerie (d'œ œ œ œ œ), rudeness.  
cérémon de la guerre (d'œ œ œ œ œ œ), the war office.  
charbonnier (d'œ œ œ œ œ œ), a coal merchant.  
échec (d'œ œ œ œ œ), a defeat.  
camaraderie (d'œ œ œ œ œ œ), good fellowship.  
canaille (d'œ œ œ œ œ œ), a low class of people; the rabble.  
canard (d'œ œ œ œ), a false story.  
cap-à-pied (d'œ œ œ œ œ œ), from head to foot.

carbonari (d'œ œ œ œ œ œ), members of a secret political society in Italy, carboni (d'œ œ œ œ), fast; Lent.  
carte blanche (d'œ œ œ œ œ œ), full power.  
carte de visite (d'œ œ œ œ œ œ), a small photograph upon a card.  
castello che dà crederci a voi rendere (d'œ œ œ œ œ œ œ), (d'œ œ œ œ œ œ œ), the fortress that parleys soon surrenders.  
casualties (d'œ œ œ œ œ), familiar talk.  
ce n'a pas de dire (that goes without saying), (œ œ œ œ œ œ œ), that is understood.  
ce n'est que le premier pas qui compte (œ œ œ œ œ œ œ), it is only the first step that is difficult.  
c'est à dire (œ œ œ œ œ œ), that is to say.  
c'est une autre chose (œ œ œ œ œ œ œ), that is quite another thing.  
chacun a son point (œ œ œ œ œ œ œ), every one to his taste.  
chaqueun d'eux son d'œ œ œ œ œ œ œ, every one inclines to his own side or party.  
Champs Elysées (œ œ œ œ œ œ), Elysian Fields; a public park in Paris.  
chanson (œ œ œ œ œ), a song.  
chansons à boire (œ œ œ œ œ œ œ), drinking songs.  
chapeau (œ œ œ œ œ), a hat.  
chapeau bas (œ œ œ œ œ œ), hats off.  
chapeau de bras (œ œ œ œ œ œ), a military cocked hat.  
chambre ardente (œ œ œ œ œ œ), the chamber where a dead body lies in state.  
chargé d'affaires (œ œ œ œ œ œ), one intrusted with state affairs at a foreign court.  
château (œ œ œ œ œ), a castle.  
châteaux en Espagne (œ œ œ œ œ œ œ), castles in Spain.  
chauffeur (œ œ œ œ œ), driver of an automobile.  
chef (œ œ œ œ œ), a man.  
chef de bataillon (œ œ œ œ œ œ œ), a major.  
chef-d'œuvre (œ œ œ œ œ œ œ), a masterpiece.  
chemin de fer (d'œ œ œ œ œ œ), a railway.  
chemin faisant (œ œ œ œ œ œ œ), by the way; in passing.  
chère amie (œ œ œ œ œ œ), a dear (said to a lady); a lover.  
che sera, sera (œ œ œ œ œ œ), what will be will be.  
cheval de bataille (œ œ œ œ œ œ), chief dependence.  
chic (œ œ œ œ œ), stylish, smart.  
chi face confessa (œ œ œ œ œ œ œ), ha ha who's silent admit his fault.  
ci git (œ œ œ œ œ), here lies.  
coiffeur (œ œ œ œ œ), a hairdresser.  
coiffure (œ œ œ œ œ), a headpiece.  
comme il faut (œ œ œ œ œ œ), proper, as it should be.  
comme tout portez vous (œ œ œ œ œ œ œ), how are you?  
commis voyageur (œ œ œ œ œ œ œ), a commercial traveler.  
compagnon de voyage (œ œ œ œ œ œ œ), a traveling companion.  
compte rendu (œ œ œ œ œ œ), rendered, a report.  
comptoir (œ œ œ œ œ), a counting-house.  
comte (œ œ œ œ œ), count.  
comtesse (œ œ œ œ œ), countess.  
con amore (œ œ œ œ œ), with affection, very earnestly.  
concerger (œ œ œ œ œ), a door-keeper.  
conclure (œ œ œ œ œ œ), to conclude.  
concurrence (œ œ œ œ œ œ), competition for, or as for, a prize.  
congratulations (œ œ œ œ œ œ), with diligence.  
congratuler (œ œ œ œ œ œ), to congratulate.  
confère (œ œ œ œ œ), a colleague.  
conférence (œ œ œ œ œ), a conference.  
conseil de famille (œ œ œ œ œ œ œ), a family council or consultation.  
conseil d'état (œ œ œ œ œ œ), a council of state; a privy council.  
consolation (œ œ œ œ œ œ), a kind of consolation.  
contrepoids (œ œ œ œ œ œ), an awkward mishap.  
cordon sanitaire (œ œ œ œ œ œ), a line of sentries to prevent, or for as a means of contagion or pestilence. Used also of other precautionary measures.  
corps diplomatique (œ œ œ œ œ œ), a dramatic body; a company of actors.  
cortège (œ œ œ œ œ), a procession.  
coulure de rose (œ œ œ œ œ œ), rose color.  
coup (d'œ œ), a stroke.  
coup de grace (d'œ œ œ œ œ), a finishing-stroke. (Formerly applied to the fatal blow by which the executioner put an end to the torments of a culprit broken on the wheel).  
coup de main (d'œ œ œ œ œ), a sudden attack, enterprise, or undertaking.  
coup de maître (œ œ œ œ œ œ), a master-stroke; with consummate skill.  
coup de pied (œ œ œ œ œ), a kick.  
coup de plume (œ œ œ œ œ œ), a literary attack.  
coup de pied (œ œ œ œ œ), a kick.  
coup d'état (œ œ œ œ œ), a first attempt.  
coup d'état (œ œ œ œ œ), a stroke of policy; a sudden and decisive blow, usually inflicted by a constitutional government.  
coup de théâtre (œ œ œ œ œ œ), a theatrical effect.  
coup d'œil (œ œ œ œ œ œ), a rapid glance.  
coupage sans peur (œ œ œ œ œ œ), fearless courage.  
route qui n'a rien de (œ œ œ œ œ œ), cost what it may.  
crève-cœur (œ œ œ œ œ), deep sorrow; grief.  
cuisine (œ œ œ œ œ), a kitchen; cookery.  
cul-de-sac (œ œ œ œ œ), the bottom of the bag; a blind alley.  
d'accord (œ œ œ œ œ), agreed; in tune.  
dame d'honneur (œ œ œ œ œ œ), a maid of honor.  
das geht alle nichts an (œ œ œ œ œ œ), that does not concern you.  
dame angare (œ œ œ œ œ œ), of good.  
dame de bonne grace (œ œ œ œ œ œ), with good will, willingly.  
debris (d'œ œ œ), refuse.  
débiter (œ œ œ œ œ), to clearance.  
débâter (œ œ œ œ œ), a young lady just entering society.  
dévoté (œ œ œ œ œ), open-breasted.  
dégagé (œ œ œ œ œ), free, easy, without constraint.  
de gâté de cœur (œ œ œ œ œ œ), in sport, sportive.  
de haute lutte (œ œ œ œ œ), by a violent struggle.  
dehors (œ œ œ œ œ), without; out of; foreign; irrelevant.  
déjeuner à la fourchette (œ œ œ œ œ œ), a cold breakfast.  
de mal en pis (œ œ œ œ œ œ), from bad to worse.  
démence (œ œ œ œ œ), dwelling; residence.  
demi-jour (œ œ œ œ œ), faint light.  
demi-laine (œ œ œ œ œ), a small cup.  
démontre (œ œ œ œ œ), to demonstrate.  
dépêche (œ œ œ œ œ), a dispatch; a message.  
dernier cri (œ œ œ œ œ œ), (the latest cry), the latest fashionable ad.  
dernier ressource (œ œ œ œ œ œ), the last resource.  
désagrément (œ œ œ œ œ œ), something disagreeable or unpleasant.  
désorienté (œ œ œ œ œ œ), confused.



[illegible][illegible]















## LITERATURE

Literature, in its most extended significance, comprehends everything written in a given language which is colored by the temperament of the writer. A geometrical treatise should be colorless, though Euclid's *Elements* are marked by a sense of form and proportion peculiar to the Greek mind. A plain statement of fact is almost invariably colored by the sentiment of the narrator and his belief as to what is interesting and important. In a narrower sense, literature is restricted to writings to which the temperament of the writer has imparted charm, whether by reason of his earnestness and breadth of mind, his love of nature or of his fellow-men, or his peculiar power of embodying impressions in a verbal form of attractiveness and suggestion.

To the writer, literature is a method of expression and communication. Men naturally desire to express themselves, to put into form their ideas on some subject that appears to them of interest and importance. Matthew Arnold, influenced largely by his familiarity with the poetry of Wordsworth, defined literature to be a criticism (expression of judgment) of life. It would be nearer the truth to say that it contained a criticism of life. As man is essentially a "social animal," in the phrase of Aristotle, he desires to communicate his views to others. Even Milton, whose soul "like a star dwelt apart," sought an audience "fit though few." This desire to express and to communicate is the impelling force to the creation of literature, even when some peculiar perversity makes a writer use a cryptic or unintelligible style. The desire to produce something beautiful—the artistic impulse—which at first would seem to be strictly individualistic, is compounded with and modified by the desire to express thought and sentiment and to communicate them to others.

This being so, it is evident that a writer must use the language of his time and must embody the views and general principles of his age. Even when a man addresses a remnant who adhere to the ideas of the last generation, or the few progressives who have an intimation of the future or have caught sight of the new light which is soon to be the "light of a common day" to the next generation, he must deal with ideas which are somewhere in vogue in his own time. For this reason literature is representative of its own age, though as the temperament which makes the writer is usually one which sympathizes with progress and hates embodied injustice, it tends to express the advanced ideas of that age rather than the reactionary or stationary ones. "Write on my tomb," said the poet Heine, "that I was a soldier in the cause of freedom." The same words might be engraved on Shelley's monument. There are many, like Shakespeare and Tennyson, to whom the ordered civilization of the present seems most significant; to others, like Sir Walter Scott, the pathos or magnificence of the past appeals more strongly. But all write for a certain number of those who sympathize with them; each must have a living audience.

For this reason the literature of any time is a mirror of the thought of the time, and as there is a gradual evolution of thought, not merely an accumulation of knowledge, the tone of literature changes with advancing civilization. It is a peculiarity of this evolution that it is not a continuous process, but is an irregular movement with periods of quiescence and of advance. Nor is the movement, as far as we can see, always in one direction. It seems to follow the line of least resistance, even if the impelling force is forward. Consequently, there are periods in which the national spirit—reflected in national literature—is in quite distinct moods. The prevailing views on politics, religion, philosophy, society, duty, and even property are gradually modified. For a number of years one set of these ideas seems prevalent, then they weaken and change, sometimes with great rapidity, and another period is inaugurated.

**ENGLISH LITERATURE.**—As the English nation is continuous, so the literature of one period is bequeathed to the next. It may seem that an early period was more energetic or more spiritual or more artistic than a later one, still the influence of what was taught in one century is never entirely lost. The best literature survives, and continues to exercise an influence on many minds long after the termination of the period in which it appeared. The bible and some of the plays of Shakespeare are still living influences. Men build on the teachings of their fathers for many generations, and the mental condition of the Englishman of to-day is a composite of the mental condition of Englishmen of every century back at least as far as the Conquest. Even the uninspired periods have significance, for something from them survives. It is as in the individual life: certain strenuous years or years of grief and soul-searching experience stand in our memory as important. Nevertheless, not a day passed that did not contribute to making us what we are. And in national literature, the least productive periods gave birth to some ideas traceable in the literary life of 1910.

**The Anglo-Saxon Period, 449-1066.**—The first two periods—the Anglo-Saxon, during which the invading Germanic invaders occupied the south and west of Great Britain; and the Norman-French, during which an army from France, under William the Conqueror, invaded the Saxon territory and established their leader as king of England—must be regarded from the literary point of view as strictly preparatory. The written languages were Anglo-Saxon, to read which requires much study on the part of an English-speaking person as to learn German; Latin, the language of the church and of international communication; and the Norman-French. It is not till there is an English language that English literature can be said to exist; and the English language, formed by the simplification of Anglo-Saxon and the sinking into it of a large number of Norman-French and Latin words, came into use in a form in which we can understand it, slowly, and was not used as a literary vehicle much before 1360, the date at which the Norman-French period is assumed to terminate. But as both Norman-French and Latin brought not

only words into the language but literary forms and modes of thought, the roots of English literature were spreading even before the language was formed. A brief reference to the works written in French, Latin and Anglo-Saxon properly finds a place in this review. The writings in Anglo-Saxon are the epic poem *Beowulf*, in the short, rhymeless, alliterative lines of the earliest times; the *Song of Widsith*; *The Traveler or Exile*; poems on religious subjects by Caedmon and Cynewulf, written after the conversion of the people to Christianity; King Alfred's translations of the legendary history of Orosius, of the ecclesiastical history of Bede, and of the *Consolations of Philosophy* by Boethius; the translations of the Gospels by the Venerable Bede, a monk of Yarrow; the Anglo-Saxon *Chronicle*, compiled at the court or at some monastery for many years; and various fragments of prose and verse which have escaped destruction. This body of the writings of our remote ancestors, though accessible only to scholars, testifies, especially in the case of Bede and Alfred, to their industry, sense of duty, responsibility and loyalty. Their writings in Latin are principally the *Ecclesiastical History of Britain* by Bede, and various fragments on kindred subjects valuable as "sources" for historians.

**The Norman-French Period, 1066-1366.**—The Saxon tongue assumed an inferior position after the Conquest, and passed through the stages called Early English and Middle English. For two centuries the language of literature was French and Latin, though the Anglo-Saxon literature was kept up fitfully till it ends abruptly in 1154, marking the death of the old civilization. Nevertheless, the writings in Norman-French must be regarded as a constituent element of English literature; for they were translated later into Middle English, and the chivalric romances, both in prose and verse, have been drawn upon down to the day of Swinburne and Tennyson. Of these the most important was the Arthurian cycle, taken originally from Celtic sources. The Normans, too, brought the light touch from France, and satire and jesting verse as well as short humorous stories were written and collected, and, in time, translated. These do not seem to be native with the Germanic races, who are more marked by sincerity and seriousness than by humor and gaiety. The Normans produced a large number of books which testified to their intellectual activity. Among these are Walter Map's *Court Triflings* and Latin rhyming songs of a bacchanalian cast, and the Launcelot legend in French, Wace's *Roman de Rou* and *Roman de Brut*, and a chronicle of the Norman dukes. Wace lived in France, in the part subject to the English kings. Geoffrey of Monmouth, a Welshman, wrote the long Latin history entitled *Chronicon*, *Sive Historia Britonum*, which, though largely fabulous, has proved a prolific source book for poets, and has been the foundation for a great number of histories down to Holinshed in Shakespeare's day. The principal writings in Middle English toward the close of the period were the *Ormulum*, a paraphrase of the daily gospel, with exhortations and homilies suggested by the Gospels, some of which have literary merit, and Layamon's long historical poem based on older books. The language of these is intelligible to us after a little practice. Robert of Gloucester also wrote a rhymed chronicle in English based largely on Geoffrey of Monmouth's book.

**First English Period, 1360-1425.**—In the reign of the great Edward III., when Chaucer was a boy, the national consciousness may be said to have become unified. France, no longer regarded as the mother country by the king and nobles, had become a foreign enemy. Into the stream of English speech had dropped a large number of French words like snow-flakes into a river. Chaucer (1340-1400) and Wycliffe (1324-1384) are the great men of this day—the former through a large body of poetry full of sense, wit, and imagination, and the latter through his sermons and translation of the bible. Chaucer illustrates for us the age of chivalry in his longer poems, and the eager, inquiring spirit of man in almost everything. He is, therefore, an example of what was said before; that one literature embodies the spirit of the age and presents its "form and pressure." Wycliffe gave form to the underlying seriousness of the English people, and their impatience with any foreign interference. Printing was invented late in this age, and gave literature a powerful instrument of expansion. Literature in Scotland began to assume character as part of British expression. The popular English ballads were a literary form of the day, especially on the border. These were composed by unknown authors, handed down in memory, written and edited by various professional amusers, and chanted or sung aloud at all sorts of gatherings. From this intimate connection with the public, they came to have the peculiar representative character, a certain directness and naïveté impossible to counterfeit, though they may seem to us rough and incomplete.

Perhaps the most important literary work produced in this period was the collection and redaction in prose by Sir Thomas Malory of a large number of the Arthurian romances called the *Morte d'Arthur*. This is the immediate source of much modern verse, and is in many regards noble prose. Chaucer's Contemporaries and Immediate Successors.—John Gower (1325-1408), John Lydgate (1370-1450), and Thomas Hoccleve (1369-1450) were by no means his equals, but William Langland (1322 to 1400, approximately) was the first poet to express the sense of injustice and hopelessness induced in thoughtful and sympathetic minds by the artificial inequalities of society and the hard lot of the unfortunate poor.

A book of some influence in this period was the absurd *Travels of Sir John de la deville*—if there was such a person. So strong is the love for the marvelous, and so late is the appreciation of the worth of accuracy in describing remote places, that this book was eagerly read, though evidently full of inventions, not to "use the uglier and shorter word." Imagination and reason, however, always try to intrude into one another's provinces, even in our venacious day. Sir Thomas More (1478-1535), a character of great worth and charm, chancellor of England, and beheaded by Henry VIII. because he would not render a legal decision in accordance with the views of that intemperate monarch, was the author of *Utopia*—written first in Latin. This is interesting as the first appearance in English of the imaginary commonwealth, the literary embodiment of the ideal toward which we are still blindly striving. It represents one of those compromises between individualism and altruism thus far possible only on paper.

**The Renaissance Period, 1525-1634.**—This period is called the "New Birth"

because the mediæval spirit largely disappeared with the Reformation, the revival of classic (Greek) learning, the extension of printing, the circumnavigation of the globe, the defeat of Spain, the invention of firearms, and the general economic advance of the community. These things combined to give men an access of mental energy and zest in life. The drama developed wonderfully from its germ in the religious mystery and the morality—pageants rather than plays—to a form which in its culmination in Shakespeare has ever since commanded the enthusiastic admiration of mankind. There were great writers in this period: Hooker, Marlowe, Shakespeare, Bacon, Webster, Spenser, Sidney, Raleigh, and a host of the second class. It was an age of great translations: North's *Plutarch*; Florio's *Montaigne*; King James' Bible; Chapman's *Homer*, and others of less note—remarkable not so much for fidelity as for transmitting the spirit of the original and clothing it in idiomatic, nervous English. The lyric verse of the period has the true song-like inspiration—witness the Songs in Shakespeare's and Beaumont's plays. Robert Herrick's short lyrics (1594-1634) are wonderfully felicitous; as, for example, *Gather Ye Rosebuds While Ye May*, No. 208; and *To Daffodils*, No. 316. Michael Drayton's *Ballad of Agincourt* is a spirited war-song. Greene, Lodge and Dekker were lyric poets as well as dramatists, and so was Ben Jonson. To enumerate the names and works of the writers of this period would require almost as much space as to chronicle the writers of novels of to-day in England. The serious poetry of the period: Michael Drayton's *Poly-Olbion*; Norton and Sackville's *Mirror for Magistrate*; William Warner's *Romans of England*, a rhymed chronicle of England; Shakespeare's *Richard the Third*; and Samuel Daniel's *History of the Civil Wars* (York and Lancaster), are not superior to the similar poetry of other periods, but add their testimony to the intellectual activity of the age. The English unrhymed pentameter or blank verse was introduced by the earl of Surrey in a translation of the *Aeneid*, circa 1545, and greatly improved by its handling by Marlowe in his plays. Shakespeare made it an instrument of wonderful flexibility, suitable for description, reflection, and all the multifarious phases of human emotion. Surrey and his friend Wyatt introduced the Italian sonnet into England, and this beautiful fourteen-line poem was used by many of the poets mentioned, in sonnet sequences of fifty or more, usually on some subject connected with the passion of love. The period gathered much inspiration in form and treatment from Italy, the home of the new learning, as is evident to any reader of Shakespeare's *Richard the Third*, who died the same year as Shakespeare (1616), wrote *The Principal Navigations and Voyages—at any time within the compass of 1500 years*. This begins, like the *Poly-Olbion* with fabulous narratives, but consists principally of authentic records, and the historian Froide rightly calls it the "epic of the English nation."

This period is the beginning of modern civilization. New England was settled, the Reformation begun, and thought was emancipated in many spheres. In spirit it is nearer akin to us than is any earlier period and the mental energy of its leading writers and the ascent in life shows how much greater is the effect on the imaginations of men of an advance in the

philosophy of life and the discovery of new realms of intellectual beauty and worth than of an advance in scientific knowledge and useful inventions which add to material resources and personal comfort without exciting in an equal degree the sense of wonder and intellectual curiosity which are the motive powers of great literature.

**The Puritan Period, 1634-1660.**—The freedom from interference in matters of religious doctrine and administration by the Church of Rome and from all fear of invasion by the kingdom of Spain which was achieved in the preceding period, made Englishmen more conscious of the importance of any authority whatever in church matters. The spirit of individualism and the belief that the bible and the example of the early church furnished an all-sufficient rule for bodies of Christian worshippers led to a revolt against the church of England. At the same time men began to question the authority of the king, and actually revived the study of Anglo-Saxon to prove that the monarchy was limited in power, and that the great council, or parliament, was supreme at least in all questions of taxation and control of the army. Charles I. was very jealous of his prerogatives or privileges, and believed that the authority of a king came direct from God. This belief, if carried out in practice, was evidently fraught with great danger to the liberty and self-respect of the subjects. It was intolerable to many Englishmen, who regarded it as directly contrary to inherited rights. The theoretical cause to an issue on the question of taxation, and as must always be the case where diametrically opposite theories of civil rights are held by nearly equal parts of the people, resulted in a civil war. This led to the beheading of the king, and the establishment of a protectorate by the general, Oliver Cromwell. England got into serious trouble with a king for seven years, but after Cromwell's death the son of the executed king was restored. The monarchy of England has been strictly limited ever since. As a matter of course, these momentous political events filled men's minds to the exclusion, temporarily, of the cultivation of literature, or indeed of any of the arts, except here and there where some solitary scholar clung to the culture of the past. But after the brilliant Renaissance England became the serious, sober Puritan England. It was not a less England but a different England.

John Milton (1608-74) was trained in the Renaissance culture. His early poems are Elizabethan in spirit, though in *Comus* the disdain of earthly pleasure which characterized the Puritan view of life is the controlling motive. He belonged to the Puritan body by birth and temperament and on the outbreak of the armed conflict he was at once drawn into the service of state. He devoted his life to defending the commonwealth, and treaties in Latin and English flowed from his pen. Though intemperate in controversial language—the mode of the time—these, especially the *Areopagitica*, in defense of a free press, are marked by great energy and elevation. A lucid prose style was not developed till the next century, so that his prose owes its reputation to fundamental qualities of thought, and not to elegance or clearness. During this time he wrote no poetry except some sixteen sonnets which justify his title of poet. Constant use of his eyes brought on a style blindness. After the Restoration he resided in London and dictated *Paradise Lost*, *Paradise Re-*

joined and *Samson Agonistes*. The great Puritan epic contains passages of dignified musical sublimity, and remains a great monument of genius, though the sentiment which inspired it is far removed from us.

Edmund Waller (1605-87), who spent a long life writing poetry, was of a different type. He was an opportunist, and, being caught in a plot to aid the banished king, Charles I., was himself banished to France, from where Cromwell allowed him to return after ten years. He introduced the rhymed pentameter couplet, somewhat in the style Pope made so familiar. He is in reality best remembered for his graceful song, *Go, Lovely Rose*.

Abraham Cowley (1628-78) was a consistent royalist, and accompanied the queen-mother to France. He was the favorite poet after the Restoration, and was esteemed by Milton. He introduced the "Pindaric Ode" form, afterward cultivated by Gray. His epic, *The Davids* has not much more than a historic interest. He was a man of fine character, great industry, and decided poetical gift.

Andrew Marvell (1620-78) was a consistent adherent of the commonwealth, and, like Cowley, a man of integrity and upright life. He introduced poetical satire. His ode on Cromwell is dignified and liberal, and contains the admirable verse on Charles I. on the scaffold, beginning:

He nothing common did or mean  
Upon that memorable scene.

The royalist poets, Suckling and Richard Lovelace, have achieved immortality by the spirit and felicity of a few songs: *To Lucasta, To Althea* and *A Ballad on a Wedding*. The theologian Jeremy Taylor (1613-67) and Thomas Fuller (1608-61) belong in this period, as does Sir Thomas Browne, whose prose treatises, *Religio Medici*, and *The Urn Burial*, have become classics by reason of the sonorous dignity of some passages and their appeal to our sense of the contrast between time and eternity, man and the universe. The delightful Isaac Walton (1593-1683) lived in this period, and wrote his *Complete Angler* and his *Lives of The Worthies*; but of course neither he nor the others mentioned in this paragraph are Puritans except in uprightness of life. Jeremy Taylor, indeed, has all the luxuriance of an Elizabethan.

**The Restoration Period, 1660-1702.**—This is a transition period from the Puritan austerity of morals and manners to the respectable good sense of the eighteenth century. The court was under French influence. The gay laxity of the Frenchman grafted onto English character is apt to produce a cynical profligacy abhorrent to most nations and to humanity itself. The drama, imitated in Dryden the neo-classicism of Racine without Racine's genius; and, in Wycherley, Congreve, Farquhar and Van-Brugh, the comedy of Molière without Molière's grasp of life. The literature of the period illustrates the period, but adds little or nothing to the world's great classics.

John Dryden (1631-1700) was a prolific writer and critic. His satirical political verse is full of wit and point, and his prose essays are not only good criticism but lucid and consecutive in style. Samuel Butler's (1612-80) *Hudibras* is rattling doggerel with flashes of wit. The true classic of the period is John Bunyan's (1628-88) *Pilgrim's Progress*. It was written when society was very corrupt but is a pure embodiment of evangelical Christianity and shows that a book to live in the after-

tions of posterity, must be fundamentally moral and representative of human life and emotion.

**The Augustan Period, 1702-1744.**—The age of Queen Anne was marked by urbanity and rationalism. In fact, the eighteenth century was throughout a common-sense century. The great mathematical period of the seventeenth century began to bear fruit in interest in natural science. Joseph Addison (1672-1719) and Richard Steele (1672-1729) were charming essayists in the light style, treating with delicate satire some social or literary topic of the day. Jonathan Swift (1667-1745) was a satirist of great power, and *Gulliver's Travels* are extremely entertaining narratives even if the reader miss the satire. Daniel Defoe (1660-1731), though best remembered by *Robinson Crusoe*, was a vigorous and voluminous pamphleteer, with a genius for journalism, then in its infancy. Pope's verse (1688-1744) is representative of the age—pointed, witty, and epigrammatic, but never rising into enthusiasm, social or intellectual; neither passionate nor profound. His mode dominated English verse for nearly a century, and is on the whole the best style for narrative or reflective verse. William Collins (1721-59) wrote odes into which he sought to infuse passion. James Thomson's *Seasons* show a true love for nature, and Young's *Night Thoughts* embody a conventional piety. All of these partake, though in a less degree than Pope's poetry, of the artificiality of the period.

**The Georgian Period, 1744-1800.**—The Georgian period is a continuation of the preceding, the date of the death of Pope being taken as convenient for dividing the eighteenth century. The advance in natural science began to bear fruit in industrial inventions, and the eve of England's great prosperity was inaugurated by the coke blast furnace in 1735, and Watt's steam-engine, 1769. The central literary figure of the period is Dr. Samuel Johnson (1709-84), whose dictionary was the first comprehensive attempt to arrange and define all the words in the English language. His poetry is largely in the manner of Pope, and his prose, in the two periodicals he published, *The Rambler* and *The Idler*, and in the *Lives of the Poets*, *Journal of a Voyage to the Hebrides*, etc., was the model for the century. To us his style seems formal and self-conscious, but he was emphatically a great writer. It is easy to imitate his balanced sentences and Latinitized diction, but the pith and wit of his phrases and the good sense of his thoughts are not so easily attained. Oliver Goldsmith (1728-74) had the gift of a less pretentious but more truly literary style. "He adorned everything he touched," Dr. Johnson said; and his two poems, *The Traveller* and *The Deserted Village*, are immortal by their melody and the kindness of the sentiment expressed. Edmund Burke was also a great writer and philosophical statesman. Johnson and his friends owe much to Boswell's *Life*, for James Boswell has a genius for reporting. In this period the first philosophical histories were written: Hume's *England* and Gibbon's *Decline and Fall of the Roman Empire*. The dramatists were far cleaner than those of the preceding period, and two comedies of Sheridan's, *The Rivals* and *The School for Scandal*, and Goldsmith's *The Squire* to Conquer are full of wit and humor, and remain a permanent possession of the stage. Thomas Gray (1716-71),

the shy and scholarly poet of Cambridge, is best remembered by his *Elegy Written in a Country Churchyard*, a poem whose gentle pathos appeals to the common heart. He wrote, too, some spirited odes, the *Progress of Poetry* and *The Bard*, which, though very carefully constructed, have never captured the public. The poets Crabbe and Cowper, though very different, may be linked together in that they wrote of everyday subjects, with no effort at elevation or heroics, and so did something to break up the artificial dignity which Dr. Johnson considered "good form" on paper. The Scotch poet Robert Burns (1759-96), the great song-writer of his land, is more typical of the future than any of the more correct and academic writers of the age; for he was a voice of the people, a prophet of manly individualism and sturdy democracy, a genius in full sympathy with humanity and a powerful satirist of social shams. In this period, too, the novel begins to assume distinct form in the hands of Fielding, Smollett and Richardson. Laurence Sterne (1713-68), though a sentimentalist, and, as a writer, full of artifice and affectation, gave in *Tristram Shandy* a model of whimsical, half pathetic, half non-sensical treatment of ordinary life which has had great influence on subsequent authors.

Toward the end of the period, the American Revolution, and still more the French Revolution, agitated violently the social atmosphere. The effect of this excitement is evident in Burke's *Letters on a Regicide Peace* and *Reflections on the Revolution in France*; but it was, from the literary standpoint, more potent in the next period. **The Romantic Period, 1800-1837.**—The general doctrine of the authority of the French king fell into a wicker basket in front of the guillotine. If there was no sacred character in the long established civil authority, why should there be any in the old literary standards? An emancipation based on individual rights is apt to spread a more determined spirit of human activity to another, and literature is but a reflection of life. Signs of rebellion against the standard of Pope and Johnson were not wanting in the close of the eighteenth century. Society is more than a well-ordered machine—it is a progressive and living organism. There is no one definite poetic form, nor is moderation and good sense the only literary virtues. Men are capable of enthusiasm, which to Dr. Johnson was a literary sin. They are capable of viewing things with wonder and excitement, of worshipping beauty blindly, and expressing themselves without the restraint of rules drawn from the practice of the past, which, guides to the fathers, become fetters to the children. Any revolt from conventionalism is really romantic, and in the nineteenth century such a revolt led to the disuse of the old literary fashions.

Two representative writers are William Wordsworth (1770-1850) and Samuel Taylor Coleridge (1772-1834). They felt that the spirit of the old ballads—partially represented in Percy's *Reliques* in 1765—was a true poetic spirit. They treated the life of men and women on every social plane, usually in the lyric form. The philosophical thought of Germany, transfused imperfectly through the mind of Coleridge, gave thinkers new intellectual conceptions. Walter Scott (1771-1832), in his ballads, songs and historical novels, viewed the past and its setting with the eye of a romanticist, though his tempera-

ment as an individual was conservative. In fact, admiration of nature in her wilder aspects—the mountain, the torrent, the storm—is a romantic motive akin to the recognition of ill-regulated human nature if only it be powerful and individualistic. This was the form romantic thought took in Byron (1788-1824). The enthusiastic Shelley (1792-1822) also disliked any form of social restraint. Pope and Johnson would have set him aside as a madman—we see in him a manifestation of generous traits, and admit his fundamental mistakes, but insist that:

The light that led astray  
Was light from heaven.

John Keats (1795-1821) is a passionate lover of beauty, an unsurpassed artist in words, while revolting from the old mechanical form, was not inspired as Shelley was by the enthusiasm for humanity. Charles Lamb (1775-1834), quaint and delightful essayist; William Hazlitt (1778-1830), a critic; Sydney Smith (1771-1845), wit and reviewer; Thomas DeQuincy (1785-1859), essayist and scholar; Thomas Moore (1779-1832), society poet and song-writer; and Thomas Campbell (1717-1844), author of some stirring war-lyrics, illustrate different phases of the intellectual life of this period. Thomas Parnell (1738-1845) and Winthrop Mackworth Praed (1802-1839) were writers, the one of humorous, the other of society verse of fine quality. Jane Austen's (1775-1817) novels are admirable sketches of the life of upper middle-class people, depicted with truth and quiet humor.

The period was marked by economic and industrial progress, and the invention of the railway and locomotive initiated the great advance of the latter half of the century.

#### The Victorian Period, 1837 to 1901.—

Though there is a marked distinction between early Victorian (to 1865) and late Victorian, it will be more convenient to consider them as continuous, the more so as they merge into one another and the poet Tennyson (1809-1892) belongs to the entire period. Thomas Macaulay (1800-1860) and Thomas Carlyle (1795-1881), though individually distinct, are markedly apart from historians of the later school; Gardiner, Stubbs, Lord Acton and the rest aimed at scientific accuracy rather than at a striking literary portraiture of the past. James Anthony Froude (1818-1894), however, perpetuated the old tradition that the historian must be an artist as well as a chronicler. Among the prose writers, John Henry Newman (1801-1890), John Ruskin (1819-1900), and, later, Walter Pater (1839-1894) take high rank as artists. The novel received early its highest development at the hands of William Makepeace Thackeray (1811-1863), Charles Dickens (1812-1870), George Eliot (1819-1880), and many minor masters. The number of good novels still produced in England is remarkable, though many of them seem to owe more to workmanship than to inspiration. Of the early Victorians, Anthony Trollope (1815-1892) is one of the most faithful depictees of social manners, and of the late Victorians, Robert Louis Stevenson (1850-1894) and John Galsworthy (1867-1933) are the most charming stylist but a constructor of semiromantic tales of vivid interest. Rudyard Kipling, in his stories of India, viewed life from a novel imaginative standpoint, and though inclined to deify material power and the life of reckless adventure, makes a convincing picture of the quiescent native civilization. The contrast between

the races is in his hands fruitful of humorous situations.

About the middle of the century (1850), Charles Robert Darwin (1809-1882) published his *Origin of Species*, and the general thesis, "things are not created, they grow," has modified very largely men's views of nature and society. Herbert Spencer (1820-1904), Thomas Henry Huxley (1825-1895) and John Tyndall (1820-1893) were among those who developed the central evolutionary concept in its applications to society and biology, and innumerable books have appeared in which the philosophy of development and growth is amplified.

The early Victorian age was an age of poetry, the later inclines to be an age of science. Alfred Tennyson (1809-1892) was devoted to the production of verse. His poetry is representative of the thought of his day, and is marked by finish and melody. Robert Browning (1812-1889) claims, it may be, a keener glance into the human soul, deeper psychical problems, than his great contemporary; but the obscure nature of his subject-matter renders him less generally acceptable. His wife, Elizabeth Barrett Browning (1806-1861), was a favorite poet in her day. All these have a marked lyrical gift. Dante Gabriel Rossetti (1828-1882), though primarily a painter, was also a poet of highly imaginative quality. Charles Algernon Swinburne (1837-1908) wrote a great deal of highly melodious verse marked by sonorous energy. His meters, largely dactylic and anapestic, have disclosed new musical resources in our language. Matthew Arnold (1822-1888), though known as a critic, was also a poet, and a few of his verses, though written in a minor key, will survive as an expression of the petulant depression which settles on thoughtful souls when the faith of their childhood is undermined and they lack impulse or force to build new foundations. George Meredith (1828-) might be mentioned among the poets did not the obscurity of his style render his meaning so cryptic as to be incommunicable, and communication to the reader of something more than a vague impression is one function of style. Meredith is a great novelist, and were he readable would be, perhaps, the greatest; but his enigmatical style presents too many puzzles for any but a specialist in paradox. Therefore Thomas Hardy (1840) must be reckoned first among the late Victorian novelists.

The drama of this period did not rise much above the level of mediocrity, in spite of the earnest efforts of Tennyson and Browning to infuse some poetry into it. Toward the end some of the "problem plays" satirized society without suggesting that it could ever be any better. The later plays which turn on some social question contain more earnestness. There is probably a time for the mocker like Shaw before the reformer, as Rabelais preceded Calvin. Since the opening of the twentieth century there seems to be an increase of seriousness almost painful in such a man as Galsworthy and the author of *The Servant in the House*. Without criticising in detail modern English literature, we may say that the tone is less flippant than it was ten years ago; that it appeals more to the genuine and broad emotions than it did; and that there seems to be a general recognition of the truth that satire and persiflage are not the only weapons for the writer, and that, to make a worthy work, he must base it on a worthy theme—some

of the old questions of sin and sorrow and injustice—and not on the superficial aspects of society or humanity.

It may be that economically, politically, and socially England is entering on a new phase of development. If so, literature, the expression equally of reason and emotion, may take on a new form of imaginative life; especially in that popular form, the drama. It is certain that earnestest social sympathy, stern love of justice, forward-looking hope and love have not perished among the people; and these, fused by the imagination, are elements of real literature, though a cynical, mocking, or hopeless feeling seems at present to deny them expression.

**AMERICAN LITERATURE.**—American literature is not readily or satisfactorily defined. It excludes all the literatures of this Western Hemisphere except that of the United States, and even in the United States is generally reckoned as exclusive of all languages except English.

**Branches of American literature.**—American literature belongs to the generic class English literature, of which other subdivisions are British, Canadian, Australian, and soon, but the specific difference between these several classes is primarily geographical and, therefore, not of much practical value.

**Provisional Definition.**—If American literature be defined as that part of English literature produced by Americans, the definition does not minister materially to clear thinking.

**Definition Discussed.**—Literature in general may, for purposes of convenience, be defined as the expression of human interests in artistic prose or verse, and then American literature might be the expression of human interests in artistic American prose or verse.

But the prose or verse of America does not differ materially in form from that of Great Britain, and, in the human mind, there is something distinctive, such as the *Leaves of Grass*, by Walt Whitman; or the *Marches of Glyn*, by Sidney Lanier; or the *Songs of the Sierras*, by Joaquin Miller. Or, American literature may be defined as the expression of American interests in artistic prose or verse, with an intimation that not all human interests, but merely some of them, make an appeal to Americans. But it is at least questionable whether Americans are not as catholic in their interests as any other nation, and hence as much inclined to make avail of all literary themes that would serve any writer's purpose. A third and perhaps feasible variation of this definition would be that American literature is the American expression of human interests in artistic prose or verse.

**Definition Accepted.**—This form of the definition concedes similarity of interests and methods, but suggests that there is possibly a difference in point of view, in fundamental conceptions, and in essential emphasis between an Englishman's and an American's treatment of similar themes. Such a difference may be readily discerned in the treatment of political, social, and religious themes, but is hardly to be noted in the realm of pure poetry. Perhaps this is as far as we can go in making any distinction between British literature on the one hand and American on the other.

**Beginning of American Literature.**—Unlike most literatures, that of America did not have an independent origin, but was a continuance in America of a litera-

ture well developed in the mother country. It was the projection of the English spirit into a new territory, where its subsequent manifestations were conditioned by its new environment and its changed purpose. This accounts for the fact that the beginning of our American literature is well-nigh coincident with our earliest English settlement; for it was in 1607 that John Smith founded at Jamestown this first settlement, and in the next year (1608) that he wrote his *True Relation of Virginia*.

In many respects, this book is almost too thrillingly romantic in its adventures and hairbreadth escapes to be wholly accepted as true history; but it is certainly of sufficient literary significance to be classed as our first specimen of American literature. This was followed by Strachey's *Wrecks and Redemption of Sir Thomas Gates*; and shortly after came the excellent translation of Ovid by George Sandys, begun in England and continued without loss of merit in this new land.

After 1620 there was a larger output in New England, for the Puritans began promptly to give expression to their supreme confidence in divine guidance and to their new-found freedom in religious thought and worship. Histories by Bradford and Winthrop evidence the hand of God in history, while Anne Bradstreet's poetry may have found its chief value in its religiousness. For literary style the *Voyage to Virginia* by Henry Norwood is perhaps the best book of this first period.

**Waxing Colonialism, 1647-1674.**—This period from 1607 to 1676 may be designated as the period of waxing colonialism, for in it the chief concern of the new colonists was to strengthen themselves and procure recruits from the home-land. This period came to an end in an incident so dramatic in its character and so far-reaching in its moral consequence as to be reckoned not a mere incident of history, but a vital link in the chain of cause and effect.

**Bacon's Rebellion, 1676.**—Bacon's rebellion, which was a protest against the arbitrary and tyrannical rule of a British governor, was in nearly every respect a prototype of that more significant protest just one hundred years later. This first Declaration was not written in words, but was elaborate in deeds wrought by that valiant young rebel, Nathaniel Bacon. At this very time, too, the New England colonists established their power to protect themselves by overcoming the Indians in King Philip's war. After these events the attitude of the colonists to the mother country could never be the same as before, though it was fully sixty years before this marked change in their relations was generally felt.

**Fixed Colonialism, 1676-1736.**—From 1676 to 1736, or thereabouts, our political life and our literary spirit might be characterized as that of fixed colonialism. This phrase signifies that the colonists had now become firmly established, with no thought of deserting their cause or surrendering their hard-earned territory; but, on the other hand, with no such supreme sense of loyal allegiance to England as had the earliest settlers. They were still dependent upon England, but this dependence had not become galling, for they had shown their power of independent action when necessary. Sermons and histories were the largest contributions of this period.

**Contrast in Spirit.**—In New England these histories and sermons alike were characterized by an overwhelming sense of obligation to divine power, while in the southern colonies they were enlivened by a fuller recognition of God's love as manifested in his dealings and exhibited in nature. This fresh, first-hand observation of nature gave rise to a new delight and enthusiasm in surprising scenery.

A comparison of Mather's sermons with Blair's, or of Bradford's history with Beverley's will illustrate this difference between the solidity and weight of the New England productions and the imagination and relative lightness of the Virginia books. William Byrd's *History of the Dividing Line*, with its sprightly comment on strange experiences and its irresistible humor, attests this literary quality even more pointedly. It was in this period that Penn gave in his life and letters a new meaning to colonization.

**Waning Colonialism, 1736-1764.**—From about 1736, when the first book was published in the south, to about 1764, which marked a dividing line in our development, comparatively little was actually achieved.

This period was marked rather by the birth of men who were to become distinguished than by occurrences or utterances of signal note.

While the literary production was limited it is impossible to believe that the outburst of independent and revolutionary thought about 1764 was not the result of long meditation and of brooding over injuries, real and fancied, and of a growing determination that one day they would be free. Jonathan Edwards is the preëminent figure in this period; but his mind turned more naturally to God's dealing with his people than to England's rule of her colonists. Ramey, an interested and intelligent contemporary historian, is clear in his own mind that the year 1764 is a turning point in our history. With that date came that outburst of oratorical arraignment and denunciation from Samuel Adams, James Otis, and Patrick Henry.

**Period of Nation-Making, 1764-1806.**—These men were the prophets and fore-runners of the proudest era of our history—that of nation-making. The vital and fascinating historical events of this period are the adoption of the Declaration of Independence; the Revolutionary war, which this declaration compelled; the provision of a constitution; the election to the presidency of the great leader who had led this war to a successful conclusion; and finally, the peaceful transfer of power from a pronounced Federalist like Adams to a self-consistent Democrat like Jefferson.

Coincident with these political achievements were literary manifestations of hardly less significance. In fact, it would not be difficult to defend the thesis that the triumphant oratory of Otis and Henry and others who came to their support, was as remarkable an event as the war itself; and certainly such papers as the Declaration of Independence and the constitution seem to be utterly inexplicable, unless one catch the full spirit of this new period of self-reliant ardor and determined zeal.

**Revolutionary Poetry.**—Closely akin to oratory is patriotic poetry, for the definitions of those two forms may be easily confounded. Anonymous songs, poems by Godfrey, Trumbull, Frenau, and others, give evidence that this emotional

life uttered by some in speech and by others in warfare, was guiding for others still the poet's stylus.

There was little time or demand for fiction in these trying times, and the academic essay must await a quieter day; but for illumined state papers or the prudential wisdom of a Franklin, there was alike the crying demand and the consequent supply.

**First Period of Nationalism, 1800-1850.**—

The year 1800 marks a peaceful transition from a decade in which men had dreaded a fancied imperialism, to an era frankly committed to an absolute trust in the people and a permanent democracy. It is, therefore, a convenient point from which to reckon our first truly national period. For the time, all difficulties had been overcome and differences adjusted and the dangers ahead hardly occurred to any but the sagest leaders.

**Jefferson to Jackson, 1800-1829.**—From 1800, when Jefferson was elected, to 1829, when Jackson became president, our country, passing through its era of expansion and of peace, pursued an even course; but when the new president took his chair a new tendency was observed. Up to 1829 our presidents had all been men of refinement and culture, bearing the stamp either of foreign training or of its best traditions. They were men of the social world, fit to meet on equal terms the world's sovereigns.

With the coming of Jackson, the rugged leader from the frontier, there were substituted for the polish and culture of the western European the training and self-confidence of the western pioneer. Nor was he much concerned with the affairs of western Europe. His mind turned instinctively to the land whence he had come; and his first thought was about strengthening the alliance, not between America and Europe, but between the several parts of his own country. It is not at all surprising that, with this new motive dominant in the capital, a new motif should run through our American literature and that the note of it should be independence and self-reliance. Perhaps this was best expressed at the time by Emerson's famous address, *The American Scholar*, which has been not untingly termed our literary declaration of independence.

This first period of our distinctive nationalism coincides with our first period of literary greatness, unless the preëminence of our Revolutionary orators be urged to the point that this was at once cause and concomitant of it. National pride is almost an essential of a national literature, and obviously a national literature ministers materially to national pride. Almost every form of literature was produced in this period, except the successful epic. Poems, plays, orations, novels, essays, histories, biographies and other types were produced before 1829, and became more abundant and more valuable after that date. Whether we turn to New England, the South, or the Middle States, this new interest in letters is noticeable.

**New World and Old.**—Great questions such as abolitionism, tariff agitation, internal improvement, etc., engaged the thought of party leaders like Clay, Calhoun, Webster; Longfellow was bringing the old world to the new by revealing its literary attainments; while Irving was showing to the old world that our own were not insignificant. Poe began and

ended in this period his career, that helped to give American literature an international value both in poetry and prose. Writers multiplied, magazines like the *Southern Literary Messenger* and *Grass* were established and maintained, and the reading public grew rapidly. New England readily assumed the primacy; but the Middle states contested her claim, and the Southern colonies showed no less versatility and native talent than these. It was especially in the period between 1829 and 1850 that literature flourished, and there was no diminution of its power when we reached its end.

**Clay Compromise.**—The Clay compromise in 1850 merely served to delay a disaster it could not avert, and produced no immediate effect upon literature.

**Period of Division.**—Even in the South, where the rumors and premonitions were thickest and loudest, the period of impending war was active in literary productivity.

**Impending War, 1850-1860.**—In fact, the greatest poetical succession our country has known, save that of Longfellow, Lowell, Whittier, in New England, was that line from the death of Poe (1849) to the death of Lanier (1881). A roll call of the names would include Hayne, Tinsel, Ryan, Pike, Thompson, Mrs. Preston, and many others. Fiction was fashionable everywhere, and the academic essay ran side by side with the partisan paper, and the academic oration gave place to the political address. Feeling ran high; and heated men to fervid and often eloquent utterance.

**War, 1860-1865.**—Even the war, lasting until 1865, could not entirely hush the literary voice; though it was true, in the South especially, that there was little time and perhaps little inclination to indulge in literary pursuits. There were battle songs and isolated poems, patriotic appeals and fiery ejaculations, and now and then the calm and solemnized utterance of the most thoughtful, but in all very little worth recalling by name in a single paragraph.

**Reconstruction, 1865-1876.**—On the contrary the literary activity between 1865 and 1876, the period of reconstruction, was exceedingly striking. There were dozens of poets to relate, memories of great men to be preserved, incidents and episodes to be recorded, and a pride of heroism to be glorified. Biographies followed fast upon each other, and called for others still, fixing in their rightful places the men of note; histories, too often *ex parte* in statement and partisan in spirit, were numerous, and no less readable because they defended a theory or a course of action; novels from which the antebellum antipathy had disappeared and short stories full of local color became fashionable; and poetry, sweetened and vitalized by sad experiences, became a daily solace. Back of this literary activity, however, loomed large and dreadful in the South the policies of reconstruction. To-day there are few, if any, apologists for this era of misguided zeal and humiliation that delayed and endangered a reunion which might well have come earlier.

**A Significant Date, 1876.**—This period ended in 1876, though its consequences could not cease so abruptly. This date does center in itself, however, certain very interesting signs that this period was practically at an end. In that year troops were withdrawn from Louisiana, the government of South Carolina passed from the hands of aliens into those of her own beloved chieftain, Wade Hampton. The people accepted not without murmur, but without violence, the decision of the electoral commission in Florida; and, as if all these signs of a reunion about to be focused on one spectacular exhibition, the Centennial celebration assembled people from all parts of our common country in the city of Brotherly Love.

**Second National Period, 1876.**—With this date the second national period began, and more than a generation has passed since of vital activities, high ideals, and magnificent efforts. Perhaps the most significant development has been

in education; and, of this in its higher reaches, Johns Hopkins, opened in 1876, may serve as a symbol. The growth of the literary spirit in our institutions may have not kept pace with the merely scholarly; but it is coming to its own, and in the meantime the whole country has felt the quickening power and enjoyed the self-sacrificing services of scholarship. Literature has found its course free, and its rewards more alluring, and, therefore, her votaries more numerous. But behind these fleet aspirants for flying fame plod worthy students doing their tasks more slowly and reaching results of more lasting value.

**Modern Types.**—The short story of local color and the historical novel, the chivalrous romance with its chain of marvelous coincidences, and purpose stories throbbing with the pressing problems of the day, have had wide popularity, for we are a nation of high-school readers. Histories have regained aplomb and poise, and essays of marked acumen and delightful finish are not rare. Oratory has cut for itself other channels, but is no less intensive and effective than of yore. Indeed, the new themes have called for a new type and method that is different from the old, but not inferior to it. The magazines are hospitable to poetry too, and, if the supply seems lacking in originality and primal excellence, it is not because our poets lack mastery of form, but because they have had no profound experiences to record.

**Promising Future.**—But all is promising. Education is widespread, scholarship has high ideals, literature has ample rewards for those who can win them, and our national spirit and pride strengthen day by day. Our first national period was from 1800 to 1850, with its most fruitful years in the second quarter of the century. It would not run counter to our present trend if the largest literary achievements of this century should fall in corresponding years.

## PARALLEL OUTLINES OF WORLD LITERATURE

In., Indian; Per., Persian; Arab., Arabian; Dao., Danish; Swed., Swedish; Ic., Icelandic; Nor., Norwegian; Sp., Spanish; It., Italian; Port., Portuguese; Rum., Russian.

TABLE I. FROM THE BEGINNING TO THE BIRTH OF CHRIST

DATE	EGYPTIAN	BABYLONIAN AND ASSYRIAN	HEBREW	INDIAN AND PERSIAN	CHINESE	HISTORICAL EVENTS
4000 to 3000 B.C.	<i>Moral Precepts of Ptah-hotep.</i> Hieroglyphic records on tomb.	<i>King Sargon</i> (3800 B.C.)— <i>Early Tablets</i> —Earliest records of Semitic line of kings ruling in North Babylonia.				Civilization in Egypt and Babylonia.
3000 to 2000 B.C.	<i>Inscription of Uoa.</i> <i>Book of the Dead</i> —A collection of prayers, mythical in character, dealing with the future state of the soul. <i>Song of the Harper</i> —(Oldest version of a funeral drinking song.	<i>Hammurabi</i> (c. 2300).—Code—Great statesman-ruler. His reign called the Golden Age of Babylonia.				2700, Chaldean literature already voluminous. 2234, Astrochemical observation in Babylonia.
2000 to 1000 B.C.	<i>Pentateuch</i> —A prose poem descriptive of battle. The nearest approach to the epic in Egyptian literature. <i>Papyrus Roll</i> (c. 1550)—An extensive medical treatise found by G. M. Ebers. <i>Amanu Letters</i> —Clay tablets. The official archives of two kings of Egypt. Show evidence of advanced literary activity.		<i>Oldest Songs of the Old Testament.</i> —The Song of Deborah. Many of the psalms.	<i>The Vedas</i> (In.).—The collective designation of the ancient sacred literature of India. Prayers, sacrificial formulae, legends, rules for conduct. <i>Mahabharata</i> (In.).—A great epic narrative, containing about 100,000 stanzas.	<i>Oldest Songs of Shoo-chi.</i> <i>A Book of Changes</i> —A book of poetry, chiefly religious.	2800, Chaldean rule over Syria. Myceanean civilization. 1380, Ramesses II. 1040, King David.
1000 to 500 B.C.	GREEK <i>Homer.</i> — <i>Iliad</i> and <i>Odyssey</i> —Epic poems containing the story of the siege of Troy and the wanderings of Ulysses. The greatest epic of all literatures. <i>Hesiod.</i> — <i>Works and Days</i> —Poet of humble descent and occupation, his work a collection of reflections and precepts relating to a rural household.	968-908, Golden age of Assyrian literature. <i>Descent of Ishar into Hades</i> , etc.—Ishar was the goddess in the religion of the Assyrians and Babylonians.	<i>Isaiah.</i> — <i>Minor prophets.</i> <i>Psalms</i> —Sacred poems. <i>Jeremiah</i> —The book of lament over Israel's humiliation.	<i>Zoroaster.</i> — <i>Avesta</i> (Per.).—The bible of Zoroastrianism. <i>Ramayana</i> (In.).—The second of the two great epic poems of medieval India.	<i>Lao-Tse.</i> —The reputed founder of the philosophy of Taoism. <i>Confucius.</i> —The most famous of all the sages of China. His doctrines were ethical and political.	1000, Zoroaster. 776, First Olympiad. 753, Founding of Rome.

TABLE I. FROM THE BEGINNING TO THE BIRTH OF CHRIST—Continued

DATE	GREEK	LATIN	HEBREW	INDIAN AND PERSIAN	CHINESE	HISTORICAL EVENTS
1000 to 500 B.C. Cont.	<b>Sappho</b> .—One of the two greatest leaders of the <i>Ionian school</i> of lyric poetry. Passion, sincerity and grace in her work. <b>Anacreon</b> .—A graceful, lyric poet who sang of wine, love, and merry company.			<b>Laws of Manu</b> (In.)—A law-book and system of cosmogony. <b>Brhadamas</b> (In.)—Writings relating to prayer and sacrifices. <b>Upanishads</b> .—Speculations on the nature of the world and man.		586, Babylonian captivity.
500 to 400	<b>Findar</b> .—The greatest of the Greek lyric poets. <b>Æschylus, Sophocles, Euripides</b> .—Writers of tragedies. Their works are so full of deep human content that they belong to the world's greatest treasures. <b>Aristophanes</b> .—The greatest writer of Greek comedy. <b>Plato</b> .—The most important of the Athenian philosophers.		<b>Job</b> .—A drama of the soul. <b>Ruth</b> .—An idyl of Jewish life in the period of the judges.		<b>Mencius</b> .—Second in rank among Chinese sages. Taught that man by nature is good.	492, Persian war. 490, Marathon; age of Pericles. 438, Parthenon. 431-404, Peloponnesian war.
400 to 300	<b>Isocrates</b> .—The fourth among the ten Attic orators. <b>Demosthenes</b> .—A celebrated Athenian orator. <b>Æschines</b> .—An Athenian orator. <b>Aristotle</b> .—The founder of the Peripatetic school of philosophy. <b>Xenophon</b> .—An Athenian historian.		<b>Malachi</b> .—A minor prophet. <b>Daniel</b> .—The apocalyptic prophet. <b>Songs of Solomon</b> .—Hebrew pastoral poems.	<b>Paulin's Sanskrit Grammar</b> .—The greatest of India's grammarians. His is the oldest preserved Sanskrit grammar. Cuneiform inscriptions near Persepolis.		399, Execution of Socrates. 390, Gauls sack Rome. 336-323, Alexander the Great.
300 to 200	<b>Theocritus</b> .—The creator of bucolic poetry in Greek. <b>Erasthenes</b> .—Famous for astronomical, geographical and mathematical labors. <b>Apollonius</b> .—A Greek scholar and epic poet. <i>Septuagint version of Hebrew Scriptures</i> .—A translation made at Alexandria by seventy Greek scholars.		<b>Ecclesiastes, or Jesus, Son of Sirach</b> .—Practical moral reflections.	<b>The Puranas</b> (In.)—The name of a class of Hindu works of mixed cosmogonic, epic, and didactic character. Beginning of the Indian drama.		264-241, First Punic war. c. 229, Achaean league. 218-201, Second Punic war.
200 to 100 A.D.	<b>Homer</b> .—A Greek bucolic poet noted for his sharp and incisive sayings. <b>Moschus</b> .—Author of eight bucolic poems elegant in expression. <b>Polybius</b> .—One of the most important Greek historians.	<b>Plautus</b> .—Comedies: <i>Amulius, Captivi, Pseudolus</i> , etc.—Rich in humor and invention, his comic art rivals that of Shakespeare. Our modern drama owes much to him. <b>Facilius</b> .—A learned and able imitator of Greek literature. <b>Ennius</b> .— <i>Annales, Tragedies</i> , etc.—The writer of the first great Roman historic epic. He made the Latin language suitable for lofty poetry. <b>Tereus</b> .—Comedies: <i>Andria, Phormio</i> , etc.—His comedies are almost modern in their elegance, and have been widely copied by French and English dramatists. <b>Lucilius</b> .— <i>Satires</i> .—A daring satirist who spoke out his full meaning in language that was sometimes lofty and sometimes half-Greek and full of slang. <b>Cato the Elder</b> .— <i>Concerning Agriculture</i> .—At once a fine writer and a writer of strong works in prose. "The father of Latin prose." <b>Varro</b> .— <i>On Agriculture, On Languages</i> .—The most learned of the Romans. A great encyclopedist who wrote on various subjects with authority. <b>Cæsar, Julius</b> .— <i>Commentaries</i> .—At once a great statesman, writer, and historian. His work on the Gallic war is read in modern schools for its perfect style. <b>Cicero</b> .— <i>Orations, Essays, Letters</i> .—Rome's finest writer. The model of prose style for all time, ranging from lofty and powerful declamations to urbane and rhythmically beautiful passages. <b>Lælius</b> .— <i>Concerning Nature</i> .—The most original philosopher-poet in Latin. He espoused the Epicurean philosophy with an intensity of feeling that was almost madness. <b>Catullus</b> .— <i>Lyrics</i> .—In his strong passionate language the model of the modern Italian poet, d'Annunzio. <b>Sallust</b> .— <i>Histories: Catiline Conspiracy, War with Jugurtha, Memoirs</i> .—An accurate historian who wrote with clearness and vigor. <b>Nepos</b> .— <i>Histories, Biographies</i> .—Style is colloquial, but biographies are fair, sympathetic and well arranged. <b>Vergil</b> .— <i>Georgics, Æneid</i> .—The greatest of the Roman epic writers. His <i>Æneid</i> , partly imitated from Homer, is remarkable for its pathos and deep feeling. <b>Horace</b> .— <i>Odes, Satires, Letters</i> .—The most polished and the most quoted of all the lyric writers. No Roman poet is so long remembered as he, for he seems to exercise a personal influence over all who read him and came to him.	<b>Sudraka</b> .—An Indian dramatist.		146, Greece became Roman territory. 113-102, Invasion by Teutons. 63, Cicero consul. 49-45, Civil war. 44, Cæsar killed. 31, Battle of Actium. 27, Augustus emperor. 4, Birth of Jesus?	

TABLE II. FROM JESUS TO MOHAMMED, 1-400 A. D.

DATE	LATIN	EARLY CHRISTIAN LITERATURE—GREEK AND LATIN	GREEK	ORIENTAL	HISTORICAL EVENTS
A. D. 1 to 100	<b>Livy</b> (59 B. C.-17 A. D.).— <i>History of Rome</i> .—A florid, fluent historian, whose history of Rome was so long that part of it has been lost, inaccurate but very readable. <b>Seneca</b> (5 B. C.-65 A. D.).— <i>Tragedies, Moralists, Essays, Satires</i> .—Epigrammatic wit, rhetorical, he created a new and florid style.		<b>Josephus, Flavius</b> (37-100).— <i>History of the Jewish War, Jewish Antiquities</i> .—A Jewish historian who wrote in Greek in such pleasing style as to win the title of "the Greek Livy." His history gives a detailed account of the fatal war with Rome. <b>Plutarch</b> (c. 46-125).— <i>Lives, Morals, Table Talk</i> .—Master in sketching character. His work is permeated by lofty enthusiasm and a warmth of portraiture.		14, Death of Augustus. 68, Death of Nero.



TABLE II. FROM JESUS TO MOHAMMED—Continued

DATE	LATIN	GREEK	ORIENTAL	HISTORICAL EVENTS
1 to 100	<p><b>Orid</b> (43 B. C.-18 A. D.) <i>Metamorphoses, Heroides</i>, etc. A court poet who wrote much that is beautiful and much that is indecent. He died in exile.</p> <p><b>Pliny the Elder</b> (23-79).—<i>Natural History</i>. An encyclopedist who has left us a large work drawn from the writings of a multitude of other men. He died in the eruption of Pompeii.</p> <p><b>Lucan</b> (39-65 A. D.).—<i>Pharsalia</i>. The author of this third important Roman epic. He dared the displeasure of Nero and lost his life.</p> <p><b>Petronius</b> (—66).—<i>Satire</i>. The first writer of realistic literature. His work is remarkable for its knowledge of the world, brilliant criticisms, and its pictures of low life in Italy.</p> <p><b>Journal</b> (40-120). <i>Satires</i>.—A vigorous satirist of Roman life, depicting hideous vices and cauterizing them with words of fire.</p> <p><b>Quintilian</b> (45-110).—<i>Rhetoric and Criticism</i>. A genial writer on practical education, abounding in anecdotes and examples.</p> <p><b>Marital</b> (45-104).—<i>Epigrams</i>.—Very witty but obscene epigrammatist.</p> <p><b>Tacitus</b> (55-117).—<i>Germany, History, Annals</i>, etc. A scientific, historical writer, though prejudiced against the emperor. His style is obscure yet terse and vigorous.</p> <p><b>Pliny the Younger</b> (61-115).—<i>Epistles</i>. A rather self-conscious personage whose letters are written with one eye on the public at large. The facts he gives regarding his time make his epistles attractive reading.</p> <p><b>Suetonius</b> (72-c. 160).—<i>Lives of the Caesars, Lives of Eminent Grammarians</i>.—A voluminous writer, from whom we have the lives of the first twelve emperors. His style is dry but precise.</p> <p><b>Apuleius, Lucius</b> (c. 130).—<i>Golden Ass, Concerning Magic</i>.—Writer of romances who portrayed the life of his time with much humor and in life-like colors.</p>	<p><b>Epictetus</b> (c. 50).—<i>Discourses</i>.—An ascetic philosopher in exile, who led a life exemplary of the pure morals which he taught.</p> <p><b>Dion Chrysostomus</b> (c. 50-117).—<i>Orations</i>.—Though his writings have but little inherent value he is famous on account of the beauty of his style.</p> <p><b>Lucian</b> (c. 120-200).—<i>Dialogues of the Dead, Satires</i>.—A bold satirist who, fertile in invention and racy in humor, ridiculed the religion, philosophy and literature of his people.</p> <p><b>Apollonius</b> (c. 150).—<i>History of Rome</i>.—His point of view is purely religious but the work is invaluable for the history of the civil wars.</p>	<p><b>Kalidasa</b> (In).—<i>Drama</i>.—The most illustrious name in the second epoch of Sanskrit literature. This is the period of artificial poetry. Kalidasa is rich in creative fancy and strong in powers of description. His fame rests on his dramas, but he is also an epic and lyric poet. Toland began. This grant work is the encyclopedia of Jewish civilization.</p>	<p>70, Destruction of Jerusalem by Titus.</p> <p>79, Destruction of Pompeii by Vesuvius.</p> <p>96-117, Trajan.</p> <p>117-138, Hadrian.</p> <p>138-161, A. Pius.</p> <p>161-180, Marcus Aurelius.</p>
100 to 200	<p><b>Early Christian Literature</b></p> <p><b>New Testament, Justin Martyr</b>.—<i>Apologetics for the Christians</i>.—Important as defender of Christian religion. Was an ardent student of philosophy. Said to have been beheaded in 165 because he refused to sacrifice to heathen gods.</p> <p><b>Chrysostom</b>.—<i>Homilies, Commentaries, Epistles</i>.—An eloquent exponent of Christian doctrine.</p> <p><b>Clement of Alexandria</b>.—<i>Exhortation to the Greeks</i>.—A defense of the faith, designed to win converts.</p> <p><b>Tertullian</b> (c. 150-250).—<i>Apology, Tracts</i>. The creator of Christian Latinity. His works imprinted on Western theology a legalistic character which it never lost. Sharply attacked mortal laxities of his time.</p> <p><b>Origen</b>.—The greatest theologian of the third century. He developed the allegorical interpretation of scripture.</p>	<p><b>Galen</b> (c. 120-170).—A celebrated physician and prolific writer. Nearly every phase of medical science is indebted to him.</p> <p><b>Diocassius</b> (c. 150-235).—<i>History of Rome</i>.—Though a Roman senator he adopted Greek in his writings. The work is a model of digression.</p> <p><b>Ptolemy, Claudius</b>.—<i>Astronomy, Almagest</i>.—A famous mathematician, astronomer, and geographer. The last work still of interest, as it contains a catalogue of the stars.</p> <p><b>Herodian</b> (c. 170-c. 240).—<i>History of the Roman Empire</i>.—A sober, accurate and impartial historian.</p> <p><b>Plotinus</b> (c. 204-270).—<i>Enneads</i>.—A Greek philosopher characterized by depth of thought and purity of language.</p> <p><b>Longinus</b> (213-273).—A rhetorician so learned that he was called "a living library and a walking museum."</p> <p><b>Longus</b>.—<i>Daphnis and Chloe</i>.—This pastoral romance is considered the best of all ancient romances on account of its graceful narrative and deep, natural feeling.</p> <p><b>Musurus</b>.—<i>Hero and Leander</i>.—A short epic of love. In its warmth of feeling it has touches that are almost modern.</p>	<p><b>Completion of Palestine Talmud.</b></p> <p><b>GOTHIC</b></p> <p><b>Bishop Ulfilas</b> (c. 311-381).—<i>Gothic Bible</i>.—The earliest literary monument in Germanic speech, translated by the bishop of the Visigoths, and formed the basis of Arian Christianity for two centuries. One manuscript is preserved in the <i>Codex Argenteus</i> in Uppsala.</p>	<p>Hau dynasty in China.</p> <p>226, New Persian empire.</p> <p>272, Defeat of Zenobia.</p> <p>273, Death of Plotinus.</p> <p>284, Reorganization by Diocletian.</p>
200 to 400	<p><b>Ausonius</b> (310-390).—<i>Mosellin</i>.—A Latin poet of Gaul in whom we first find the modern love of nature predominant. His best known poem is called <i>Mosella</i>, from the river Moselle; but he also dwelt on many subjects.</p> <p><b>Claudian</b> (c. 365-400).—<i>Raps of Proserpine, Epigrams</i>, etc. The last of the classical Latin poets. His poetical gifts were considerable, especially in the mastery of language and meter.</p>	<p><b>Athanasius</b> (c. 293-373).—<i>Discourses, Historia</i>.—The father of Greek orthodoxy.</p> <p><b>St. Ambrose</b> (c. 340-397).—A learned bishop noted for his mild and gentle, but indefeasible character.</p> <p><b>Jerome</b> (c. 340-420).—<i>Bible</i> (Vulgate).—This translation was destined to become the Bible of the occident.</p> <p><b>Prudentius</b> (c. 348-405).—<i>Hymns</i>.—The greatest of the early Latin Church. The <i>Hymns</i> were designed for devotional use.</p> <p><b>St. Augustine</b> (354-430).—<i>Confessions</i>.—Greatest of the Latin fathers. Taught that outside of the true church there could be no salvation.</p> <p><b>Fortunatus, Venantius</b> (c. 530-600).—<i>Hymns, Epitaphs, Epistles</i>.—The chief Latin poet of his time. The <i>Royal Banners Forward Go</i>, is his most famous hymn.</p> <p><b>Gregory the Great</b> (540-604).—<i>Exposition of Job, Dialogues</i>.—As a poet he was the great organizer of the ritual and public services of the Roman Church. One of the four greatest teachers of the Western church.</p>	<p><b>Completion of Palestine Talmud.</b></p> <p><b>GOTHIC</b></p> <p><b>Bishop Ulfilas</b> (c. 311-381).—<i>Gothic Bible</i>.—The earliest literary monument in Germanic speech, translated by the bishop of the Visigoths, and formed the basis of Arian Christianity for two centuries. One manuscript is preserved in the <i>Codex Argenteus</i> in Uppsala.</p> <p><b>Musurus</b>.—<i>Hero and Leander</i>.—A short epic of love. In its warmth of feeling it has touches that are almost modern.</p>	<p>312, Edict of Milan by Constantine.</p> <p>361-363, Julian.</p> <p>376, Visigoths admitted.</p> <p>393, Death of Theodosius.</p> <p>410, Alaric sacks Rome.</p> <p>449, Saxons invade Britain.</p>
400 to 500	<p><b>Boethius</b> (470-525).—<i>Consolations of Philosophy, Translations</i>.—Almost the last Latin prose writer who also knew Greek. He ends the Roman period of literature with his philosophic treatises.</p>	<p><b>Completion of Palestine Talmud.</b></p> <p><b>GOTHIC</b></p> <p><b>Bishop Ulfilas</b> (c. 311-381).—<i>Gothic Bible</i>.—The earliest literary monument in Germanic speech, translated by the bishop of the Visigoths, and formed the basis of Arian Christianity for two centuries. One manuscript is preserved in the <i>Codex Argenteus</i> in Uppsala.</p> <p><b>Musurus</b>.—<i>Hero and Leander</i>.—A short epic of love. In its warmth of feeling it has touches that are almost modern.</p>	<p><b>Completion of Palestine Talmud.</b></p> <p><b>GOTHIC</b></p> <p><b>Bishop Ulfilas</b> (c. 311-381).—<i>Gothic Bible</i>.—The earliest literary monument in Germanic speech, translated by the bishop of the Visigoths, and formed the basis of Arian Christianity for two centuries. One manuscript is preserved in the <i>Codex Argenteus</i> in Uppsala.</p> <p><b>Musurus</b>.—<i>Hero and Leander</i>.—A short epic of love. In its warmth of feeling it has touches that are almost modern.</p>	<p>455, Vandals sack Rome.</p>
500 to 600	<p><b>Boethius</b> (470-525).—<i>Consolations of Philosophy, Translations</i>.—Almost the last Latin prose writer who also knew Greek. He ends the Roman period of literature with his philosophic treatises.</p>	<p><b>Completion of Palestine Talmud.</b></p> <p><b>GOTHIC</b></p> <p><b>Bishop Ulfilas</b> (c. 311-381).—<i>Gothic Bible</i>.—The earliest literary monument in Germanic speech, translated by the bishop of the Visigoths, and formed the basis of Arian Christianity for two centuries. One manuscript is preserved in the <i>Codex Argenteus</i> in Uppsala.</p> <p><b>Musurus</b>.—<i>Hero and Leander</i>.—A short epic of love. In its warmth of feeling it has touches that are almost modern.</p>	<p><b>Completion of Palestine Talmud.</b></p> <p><b>GOTHIC</b></p> <p><b>Bishop Ulfilas</b> (c. 311-381).—<i>Gothic Bible</i>.—The earliest literary monument in Germanic speech, translated by the bishop of the Visigoths, and formed the basis of Arian Christianity for two centuries. One manuscript is preserved in the <i>Codex Argenteus</i> in Uppsala.</p> <p><b>Musurus</b>.—<i>Hero and Leander</i>.—A short epic of love. In its warmth of feeling it has touches that are almost modern.</p>	<p>527-565, Justinian.</p> <p>571, Death of Mohammed.</p> <p>590, Gregory becomes pope.</p> <p>593, Books printed in China.</p>

TABLE III. FROM MOHAMMED TO DANTE, 600-1300

DATE	ENGLISH	GERMAN	SCANDINAVIAN	ARABIAN, PERSIAN	HISTORICAL EVENTS
600 to 700	<b>Bede or Baede (673-735).—</b> <i>Ecclesiastical History, Poems</i> —Inspired by early Christian sentiment. <b>Cædmon (673?).—</b> <i>Paraphrase of Scripture</i> —Showing how strong an appeal the bible story made to the reverence of the race.	This is the period of the infiltration of Roman civilisation and Roman ideas.	400-1000, <i>Hundreds of Runic Inscriptions</i> (Dan.).—Very brief. Some in verse. Generally commemorative the dead. Very important for history, language, mythology. 400-1500, <i>About 2000 Runic Inscriptions</i> (Swed.).—Some authors known, as Uhir, Bah, Amundin, Krunau. About 160 are in poetic form. Important for history, language, art.	<b>Mohammed's Koran.</b> —The sacred book of Islam, collected shortly after his death. Many odes and lyrics in Arabic. <b>Bundeshah (Per.).</b> —Date very uncertain. A work on cosmogony and theology.	622, Flight of Mohammed from Mecca, the Hegira. 632, Death of Mohammed. Rapid spread of Mohammedanism. 687, Battle of Teutry.
700 to 900	<b>Traveler's Song (700?).</b> —Illustrates the sentiment of a wandering singer and the Anglo-Saxon's love of home. <b>Alcuin (735-804).—</b> <i>Letters, Biographies, Crus. Etc., Admonitions</i> —Friend of Charlemagne, wrote a comparatively pure Latin. <b>Cynewulf (c. 750-825).—</b> <i>Poems</i> —Serious poems of moral simplicity and power.	<i>Lay of Hildebrand, Wassabrunn Prayer, Muspilli</i> —All are in the old Germanic alliterative verse. Authors are unknown. The <i>Lay of Hildebrand</i> is an example of the rough, unsmooth ballad out of which the German national epic was, later, to be constructed.		In the latter half of this century Arabia enjoyed a glorious reputation in science and literature under the patronage of Haroun-al-Raschid. <b>Abu Hanifah (702-772).—</b> <i>Code of Laws</i> —Still in force in many parts of the Ottoman empire. <b>El-Ainval—Romance of Amor (Arab.).</b> —A long poem upon the poet Antara.	711, The Arabs enter Spain. 732, Arabs repelled at Tunes. 751, Pippin the Short, king of Franks.
900 to 990	<b>Alfred the Great (c. 846-901).—</b> <i>Translations</i> —Some original matter interpolated, e. g., narrative of others; versified by Langfellow.	<b>Orfild (c. 800-870).—</b> <i>Gospel Book</i> —A poetic version of the life of Christ, and like the <i>Heland</i> , doubtless intended to supplant the old heathen epic. <i>Heland (c. 830?)</i> —An alliterative epic in Old Saxon speech, treating the gospel account of the life of Christ.  Numerous religious writings, visions of judgment, lives of saints, epic gospel narratives, harmonies, and a few political compositions fill up the tenth century.	<b>Skalds (800-1100).—</b> <i>Dræpas</i> (i. e., vivid laudatory poems describing feasts and battles of contemporary Scandinavian and English rulers. Traveled from court to court. <b>Anonymous (850-200).—</b> <i>Elder (or poetic) Edda</i> (i. e.,) About 35 poems in alliterative verse dealing with myths (Odin, Thor, Frey) and hero legend (Sigfrid story). Composed in Iceland, Norway, Greenland; vivid, dramatic, terse.	<b>Al-Khifdi (c. 800).—</b> <i>Medicine, Astrology</i> (Arab.).—Remains of 200 works on science and philosophy. <b>Abu Ubaidah (824). (Arab.).—</b> <i>History</i> , in 105 monographs including histories of Mecca and Medina.	800, Charlemagne crowned emperor of the west. 809, Death of Haroun-al-Raschid. 814, Death of Charlemagne.
900 to 1000		<b>Eikehard—</b> <i>Lay of Walthar of Aquitaine</i> (c. 930)— <i>Waltharius manu forte</i> is a short epic in Latin hexameters describing the adventures of Hildebrand of Burgundy and of Waltharius as hostage at the court of Attila.  <b>Roswitha or Hrotswith.—</b> <i>Dramas</i> —A nun of Gandersheim who wrote six dramas in Latin in the Christian spirit of her time to take the place of the pagan plays of Terence.	<b>Egil Skallagrimsson (Ic.). (900 - 983).—</b> <i>Hilfudlau (Head-ransom); Sonarrætt, (Son-Laws)</i> —Dating straight-forward, original in expression. <b>Eyvind Skuldaspillir (Nor.). (c. 910-965).—</b> <i>Poem on King Hiden, Hildeyatal</i> —Is a fine poet and excellent man, but initiator of predeceases, whence his nicknames "destroyer of skulls." <b>King Harald Hargræ (Nor.). (933).—</b> <i>Sinsæfndardrapo</i> —Encouraged skaldic poetry and is said to have been a poet himself. <b>Thorbjörn Hornklofi (Nor.).—</b> <i>Poem on Harald Hargræ</i> Words. <b>Einar Helgason Skaldaglam (Ic.). (c. 945).—</b> <i>Yellala (Gold-wind)</i> —Powerful and exalted. Fine diction. Melodious verse. <b>Halfræd Vandradaskald (Ic.). (c. 970).—</b> <i>Poems on Varanus Chief</i> —Faithful, upright, but a bitter enemy. Fluent poet. Master of language and verse. <b>Sigrat Thordarson (Ic.). (995-1045).—</b> <i>Vikingspætur (Viking lays); Borgþingarsætur (Lays of Frankens)</i> —Greatest poet of days of Olaf the Holy. Tactful, discreet, honest, ease and elegance, etc.	<b>Budagi (—954). (Pers.).—</b> <i>Dizun</i> —Graceful, fluent lyrics. The first great poet of Mohammedan Persia. <b>Shu-Alrami (905). (Arab.).—</b> <i>Poems</i> —Lyrics and other types of verse.	843, Treaty of Verdun. 876, Treaty of Wedmore.
1000 to 1100	<b>Alfric (955-1020).—</b> <i>Homilies, Grammar</i> —Writings in Latin. A man of power and sincerity. During the tenth and eleventh centuries the Anglo-Saxon or English language was undergoing radical grammatical changes. The great authors of these two centuries wrote in Latin, it being intelligible to the learned, for whom they wrote.		<b>King Harald Hargræ (Nor.). (933).—</b> <i>Sinsæfndardrapo</i> —Encouraged skaldic poetry and is said to have been a poet himself. <b>Thorbjörn Hornklofi (Nor.).—</b> <i>Poem on Harald Hargræ</i> Words. <b>Einar Helgason Skaldaglam (Ic.). (c. 945).—</b> <i>Yellala (Gold-wind)</i> —Powerful and exalted. Fine diction. Melodious verse. <b>Halfræd Vandradaskald (Ic.). (c. 970).—</b> <i>Poems on Varanus Chief</i> —Faithful, upright, but a bitter enemy. Fluent poet. Master of language and verse. <b>Sigrat Thordarson (Ic.). (995-1045).—</b> <i>Vikingspætur (Viking lays); Borgþingarsætur (Lays of Frankens)</i> —Greatest poet of days of Olaf the Holy. Tactful, discreet, honest, ease and elegance, etc.	<b>Firdusi (c. 940-1020). (Pers.).—</b> <i>Book of Kings</i> —One of the foremost poets of all literature. A great epic dealing with the Persian monarchs. <b>Mutanabbi (965). (Arab.).—</b> <i>Dizun</i> —A series of poems. <b>Avicenna (980-1037). (Arab.).—</b> <i>Medicine, Philosophy</i> —Philosophical and scientific works. His work on philosophy has been a text-book for European universities.	962, Restoration of Holy Roman empire. 981, Greenland discovered.
	<b>William of Malmesbury (1090-1142).—</b> <i>History of Kings of England</i> —Of some value as an original. <b>Geoffrey of Monmouth (1154).—</b> <i>History of English Kings</i> —Largely legendary.	<b>Rudolf (c. 1030?)</b> —A Latin epic with novelties features, describing the life of the time. <b>William—</b> <i>Song of Solomon</i> —William Abbot of Eberbach in Bavaria, translated the <i>Song of Solomon</i> into German. <b>Ezsa—</b> <i>Lay of Eisa</i> —A scholastic of Bamberg whose <i>Lay</i> was to be sung as an anthem on the last great pilgrimage to the Holy Sepulchre before the crusades.	<b>King Harald Hargræ (Nor.). (933).—</b> <i>Sinsæfndardrapo</i> —Encouraged skaldic poetry and is said to have been a poet himself. <b>Thorbjörn Hornklofi (Nor.).—</b> <i>Poem on Harald Hargræ</i> Words. <b>Einar Helgason Skaldaglam (Ic.). (c. 945).—</b> <i>Yellala (Gold-wind)</i> —Powerful and exalted. Fine diction. Melodious verse. <b>Halfræd Vandradaskald (Ic.). (c. 970).—</b> <i>Poems on Varanus Chief</i> —Faithful, upright, but a bitter enemy. Fluent poet. Master of language and verse. <b>Sigrat Thordarson (Ic.). (995-1045).—</b> <i>Vikingspætur (Viking lays); Borgþingarsætur (Lays of Frankens)</i> —Greatest poet of days of Olaf the Holy. Tactful, discreet, honest, ease and elegance, etc.	<b>Hartiri (c. 1054-1123). (Arab.).—</b> <i>Maknûd</i> —Moral and satirical prose and verse.	1054, The great schism.
			<b>Runic Inscriptions (Nor.). (1050-1350)</b> —Some in verse. About 150, and of no great importance. Some older than 1050.	<b>Al-Hasan al-Nisaburi (died 1015). (Arab.).—</b> <i>Commentary on the Koran</i> .	1066, Norman conquer England. 1096, First crusade.

TABLE III. MOHAMMED TO DANTE—Continued

DATE	ENGLISH	GERMAN	FRENCH	SCANDINAVIAN	SPANISH	ARABIAN, PERSIAN	HISTORICAL EVENTS
1100 to 1200		<i>The Lay of the Nibelungen</i> —It is the history of Germany.				<b>Unknown</b> , twelfth century (Sp.).— <i>Poem of the Cid</i> —Great narrative poem on the national hero.	1118. Order of Knights Templars founded. 1128. Battle of the Standards. 1163. Order of the Dame of Paris founded.
1200 to 1300	<b>Roger Bacon</b> (1214-1294).— <i>Natural Science, Philosophy</i> —A man in advance of his age.	<b>Wolfram von Eschenbach</b> (c.1170-1220).— <i>Parzival</i> —The greatest epic of its time. A psychological treatment of the story of the apostle Parzival in his search for the Holy Grail. <b>Gottfried von Strassburg</b> (c.1200).— <i>Tristan and Isolde</i> —His great court epic is naturalistic, breathing the spirit of French poetry. Gottfried was the master poet of romance. <b>Berthold von Regensburg</b> (1247-1272).— <i>Sermons</i> —The greatest German preacher of the middle ages. His language is direct, dramatic, sincere. <b>Master Eckhart</b> (1260-1327).— <i>Sermons</i> —The first of the mystics.	<b>Villehardouin</b> (1150-1212).— <i>Conquest of Constantinople</i> —The most valuable French prose of the Middle Ages. <b>Jean, sire de Joinville</b> (1224-1317).— <i>Life of St. Louis</i> —A friend of Louis IX., whom he accompanied in the first crusade. <b>Marie de France</b> .— <i>Lays, Fabliau</i> —Familiar charm from their elegant consciousness and their personal note. <b>Acceste et Nicolette</b> —An excellent satire of the twelfth century. <b>Lorris and Menag</b> .—Joint authors of the <i>Romance of the Rose</i> , a poem on the "Art of Loving."	<b>Snorre Sturlason</b> (fl. 1178-1241).— <i>Heimskringla</i> —History of kings of Norway from prehistoric times to 1177. <b>Ynglinga (or prose) Edda</b> .—Scientific handbook on Norse mythology poetic diction and versification. <b>Saxo Grammaticus</b> (Dan.). (1200).— <i>History of Denmark</i> .—Father of Danish history, begins with mythical ancestor Dan.		<b>Omar</b> (c.1123). (Pers.).— <i>Qasidas</i> —Philosophic and meditative stanzas. <b>Avicenna</b> (1126-1198). (Arab.).— <i>Science, Philosophy</i> —Important works on criticism, astronomy, medicine. <b>Sadi</b> (Pers.) (c.1184-1201).— <i>Rose-Garden, Tree-Garden, Odes</i> —Catholic in view and taste, elegant in finish.	1196. Observatory at Seville. 1206. Franciscan order founded. 1218. Magna Charta signed. 1229. University of Toulouse founded. 1248. Cathedral at Cologne begun.

TABLE IV. FROM DANTE TO THE PRE-REFORMATION PERIOD, 1300-1600

DATE	ENGLISH	GERMAN	FRENCH	PERSIAN	ITALIAN, SPANISH, PORTUGUESE	SCANDINAVIAN	HISTORICAL EVENTS
1300 to 1400	<b>Sir John Mandeville</b> (1300-1371).— <i>Travels</i> .—Possibly a pen name. His travels are an extraordinary medley of invention and report.	<b>Tauler</b> (1300-1360).— <i>Sermons</i> .—A great preacher of Strasbourg, and the forerunner of Luther.			<b>Dante Alighieri</b> (It.). (1265-1321).— <i>Divine Comedy</i> .—Great epic, written in the first person. <b>Francesco Petrarca</b> (It.). (1304-1374).— <i>Sonnets and Songs</i> .—Lyrics mostly concerning Laura. <b>Giovanni Boccaccio</b> (It.). (1313-1375).— <i>Decameron</i> .—A series of 100 tales in prose.	Collections of old provincial laws (Dan.). (c. 1300).—Fine picture of life of early times in all its phases. <b>St. Birgitta</b> (Swed.). (1303-1373).— <i>Revelations</i> .—Mystical conversations between Christ, Mary and Saints.	1295. Marco Polo returned to Venice.
1400 to 1500	<b>John Wycliffe</b> (1324-1384).— <i>Translation of Bible</i> .—A man of great power and sincerity. A dialectician and scholar. <b>William Langland</b> (1330-1400).— <i>Piers the Plowman</i> .—Extraordinary man of broad humanity. First expression of the voice of the poor. <b>Geoffrey Chaucer</b> (1340-1400).— <i>Canterbury Tales, Short Poems</i> .—A scholar, a poet of chivalry and a witty narrator of stories in verse.		<b>Jean Froissart</b> (1337-1410).— <i>Chronicles</i> .—A vivid and striking account of the events which took place in his days.	<b>Hafis</b> (c. 1300).— <i>Poems</i> .—Lyrics of a very high order.		<b>Kyrtel Aggrimsson</b> (Ic.). (1350).— <i>Lays</i> .—Artfully wrought, popular religious poem.	1348. University of Prague founded. 1396. University of Heidelberg founded.
	<b>Sir Thomas Malory</b> (1400—).— <i>Morte d'Arthur</i> .—Worked over a large part of the Arthurian legends in prose. The original for Tennyson's <i>Idylls of the King</i> .	<b>Gottfried von Kalsberg</b> (1415-1510).— <i>Sermons</i> .—The representative preacher of the century.	<b>Charles of Orleans</b> (1401-1468).— <i>Poems</i> .—Called the last of the Trouvères. His poetry in which art takes too often the place of thought, reaches a perfection of form in which we see already the approach of the Renaissance.		<b>Alfonso López de Mendoza</b> (Sp.). (1398-1458).— <i>Sonnets</i> .—The first in Spain to compose sonnets in imitation of Petrarch. <b>Matteo M. Bolardo</b> (It.). (1420-1494).— <i>Orlando Furioso</i> .—A long romantic poem. <b>Girolamo Savonarola</b> (It.). (1452-1498).— <i>Sermons, Poems</i> .—Political and theological writings. <b>Niccolò Machiavelli</b> (It.). (1469-1527).— <i>History, The Prince</i> .—Profound but not too scrupulous. <b>Ludovico Ariosto</b> (It.). (1474-1533).— <i>Orlando Furioso</i> .—A romantic poem of chivalry.		1409. University of Leipzig founded.
	<b>Sir Thomas More</b> (1479-1535).— <i>Utopia, Life of Edward V.</i> .—A man of fine character. This suggested perhaps by Plato's Republic.	<b>Johann Reuchlin, Erasmus of Rotterdam</b> .—Famous humanistic scholars.	<b>François Villon</b> (1431-1463).— <i>Suites</i> .—The most remarkable poet of the fifteenth century. His <i>Suites</i> are among the masterpieces of French poetry. <b>Philippe de Commines</b> (1445-1509).— <i>Memoirs</i> .—Give the best accounts we have of the reigns of Louis XI. and Charles VIII.			<b>Christian Fredericus</b> (Dan.). (1480-1554).— <i>Translation of Luther's Bible</i> (1550)—Father of modern Danish literary language.	

TABLE IV. DANTE TO THE PRE-REFORMATION PERIOD—Continued

DATE	ENGLISH	GERMAN	FRENCH	ITALIAN, SPANISH, PORTUGUESE	SCANDINAVIAN	HISTORICAL EVENTS
1500 to 1599 CEN.	<p><b>William Tyndale</b> (1484-1536).—<i>Translation of Bible</i>—On his translation of the scriptures later versions are founded.</p> <p><b>Hugh Latimer</b> (1485-1555).—<i>Sermons</i>—One of the most distinguished of British reformers.</p> <p><b>Andrew Wyntoun</b>.—<i>Chronicle of Scotland</i>—Story of Wallace. Much admired by Walter Scott.</p> <p><b>Sir Thomas Wyatt</b> (1503-1542).—<i>Sonnets, Lyrics</i>—Introduced with Howard the Italian forms; sonnet and madrigal; made Italian literature a new force in England.</p> <p><b>Henry Howard</b> (earl of Surrey). (1517-1547).—<i>Translation of the French, Songs, Sonnets</i>—Introduced Italian forms and blank verse.</p> <p><b>John Foxe</b> (1517-1567).—<i>Book of Martyrs</i>—His book had great influence in strengthening the reformers and was one of the literary influences on the Puritans who came to America.</p> <p><b>Thomas Sackville</b> (1526-1606).—<i>Mirror for Magistrates</i>. A poet of force and imagination. Afterwards, as Lord Buckhurst, a courtier and politician. Worked in collaboration with others and had a hand in the first English tragedy.</p> <p><b>Edmund Spenser</b> (1552-1599).—<i>Fierce Queen, Shepherd's Calendar</i>. Called the "poet's poet." Great in romantic allegory, the ode, and the sonnet.</p> <p><b>Sir Walter Raleigh</b> (1552-1618).—<i>History of the World</i>—A politician and adventurer; friend of Spenser. Some fine passages in his work.</p>	<p><b>Martin Luther</b> (1483-1521).—<i>Translation of the Bible, Treatises, Hymns</i>—Inaugurator of the Reformation.</p> <p><b>Ulrich von Hutten</b> (1488-1523).—<i>Poems, Songs</i>—Humanist and soldier; he supported the work of Luther.</p> <p><b>Hans Sachs</b> (1494-1567).—<i>Sixteen Twentieth Plays, Poems</i>—Famous cobbler-mastersinger of Nuremberg.</p> <p><b>Philipp Melancthon</b> (1491-1560).—<i>Treatises, Text-Books</i>—Colleague of Luther.</p> <p><i>Till Eulenspiegel</i>, oldest version (1518)—A large collection of witty, popular anecdotes, the hero of which was the prince of rogues, Till Eulenspiegel.</p> <p><b>Johann Fischart</b> (1550-1590).—<i>Treatises, Epic and Satire</i>—The master of German satire in the later sixteenth century. Achieved fame in 1577 by <i>The Fortunate Ship of Zürich</i>, treating the friendship between the cities of Zürich and Strasbourg. Toward the end of the sixteenth century English comedians introduced English plays into Germany.</p>	<p><b>Francis Rabelais</b> (1483-1553).—<i>Philosophy, Satire</i>—Scholar, philosopher, satirist, and innovator. Rabelais has left to posterity in the <i>Life of Gargantua and Pantagruel</i> a compendium of his vast knowledge.</p> <p><b>Clément Marot</b> (1495-1544).—<i>Poems</i>—Excelled in the lighter forms of poetry, such as the madrigal, the rondeau, the ballad, etc. Rabelais calls his poems "elegant badinage."</p> <p><b>John Calvin</b> (1509-1564).—<i>Institutes of Religion</i>, etc. The second head of the reform. His <i>Institutes of the Christian Religion</i> is a statement of the doctrine of the religious innovators and, like his other works, shows a remarkable erudition.</p> <p><b>Jacques Amyot</b> (1513-1584).—<i>Translations from the Greek</i>. These translations, especially those from the works of Plutarch, stand as a model of the best language of the sixteenth century.</p> <p><b>Pierre de Ronsard</b> (1524-1585).—<i>Sonnets, Odes</i>, etc.—As a poet Ronsard enjoyed in his time a celebrity second to none.</p> <p><b>Etienne Jodelle</b> (1532-1573).—<i>Cleopatra, Eugène</i>—His <i>Cleopatra</i> may be said to mark one of the epochs of the French theater.</p> <p><b>Michel de Montaigne</b> (1533-1592).—<i>Essays</i>—The work of the sixteenth century the most read to-day. Writing without order or plan he reaches the knowledge of mankind through the study "in good faith," of himself.</p>	<p><b>Francesco Guicciardini</b> (1482-1532).—<i>History, Politics</i>.—Cool, observant <i>Recollections</i>; masterly <i>History of Italy</i>.</p> <p><b>Gil Vicente</b> (Port.), (c. 1485-1530).—<i>Graciosa</i>—Founder of the Portuguese drama.</p> <p><b>Vittoria Colonna</b> (It.), (1490-1547).—<i>Poems</i>—Sonnets on the death of her husband.</p> <p><b>Juan Boscán</b> (Sp.), (1493-1543).—<i>Poems</i>—Introduced Italian measures into Spain.</p> <p><b>Jacopo Nardi</b> (It.), (1496-1556).—<i>History of Florence</i>—Animated history with the faults of a contemporary.</p> <p><b>Benvenuto Cellini</b> (It.), (1500-1571).—<i>Autobiography</i>—A remarkable picture of his times.</p> <p><b>Garciلاس de la Vega</b> (Sp.), (1503-1536).—<i>Poems</i>—Refined but lacking in originality.</p> <p><b>Muriado de Mendoza</b> (Sp.), (1503-1578).—<i>History, Fiction</i>—<i>War of Granada</i>, a comic novel, <i>El Lazarillo de Tormes</i>.</p> <p><b>Giorgio Vasari</b> (It.), (1512-1574).—<i>Lives of Celebrated Artists</i>—A gossip book of information and anecdote about artists.</p> <p><b>Luis de Camões</b> (Port.), (1524-1579).—<i>Lusad, Poems</i>—Greatest poet of Portugal. <i>Lusad</i> a celebrated historical epic.</p> <p><b>Ponce de León</b> (Sp.), (1528-1591).—<i>Lyrics</i>—Original poems; translations from classics; translations from Hebrew poets.</p> <p><b>Bretille</b> (Sp.), (1533-1595).—<i>Ardena</i>—An epic poem on the revolt in Chile.</p> <p><b>Fernando Herrera</b> (Sp.), (1534-1597).—<i>Lyrics</i>—Erasmo and patriotic poems; author called the Divine.</p> <p><b>Torquato Tasso</b> (It.), (1541-1596).—<i>Jerusalem Delivered</i>—The latter a great epic on the capture of Jerusalem in 1099.</p> <p><b>Miguel de Cervantes Saavedra</b> (Sp.), (1547-1616).—<i>Don Quixote, Poems in Galatea</i>—The first is the great masterpiece of Spanish literature. <i>Galatea</i>, a pious pastoral romance in prose, with verses.</p>	<p><b>Broder Nisla</b> (Dan.), (1495).—<i>Attemkrønike</i> (rhymed chronicle).—Each king tells his own life and deeds. First Danish book printed.</p> <p><b>Olaus Petri</b> (Swed.), (1493-1555).—<i>Religious Works, History, Hymns</i>—Unbiased historian. Luther of Sweden. Father of modern Swedish literary language.</p> <p><b>Hans Tausen</b> (Dan.), (1494-1561).—<i>Editorial</i>—Age of Reformation. Polemical.</p> <p><i>Morality and Mystery Plays</i> (Dan.), (1500-1600)—Same origin and fate as in other countries.</p> <p><i>The Reformation</i> Raphael and Michelangelo in art. 1509-1547. Henry VIII, king of England.</p> <p>1498. Martyrdom of Savonarola.</p> <p>1531. College de France.</p>	<p>1492. Discovery of America.</p>

TABLE IV. DANTE TO THE PRE-REFORMATION PERIOD—Continued

DATE	ENGLISH	GERMAN	ITALIAN, SPANISH, PORTUGUESE	SCANDINAVIAN	HISTORICAL EVENTS
1500 to 1600 Cont.	<p><b>Richard Hooker</b> (1533-1600).—<i>Ecclesiastical Polity</i>—His prose has dignity and force. His book is the authority for the Church of England.</p> <p><b>Sir Philip Sidney</b> (1554-1586).—<i>Arcadia</i>, Poem—Singular beauty of character. <i>Arcadia</i> is a pastoral romance of great merit.</p> <p><b>Francis Bacon</b> (1561-1626).—<i>Essays</i>, Philosophy—Many beautiful and acute things in his essays and his philosophical works.</p> <p><b>Christopher Marlowe</b> (1564-1593).—<i>Dramas</i>—Most important of Shakespeare's predecessors. His tragedies, although full of horrors, are sublime in tone.</p> <p><b>William Shakespeare</b> (1564-1616).—<i>Dramas</i> (37 plays), <i>Sonnets</i>—The best of all writers, compounded of wit, humor, characterization, philosophy, music and phrase power and construction.</p>		<p><b>Pietro Sardi</b> (It.), (1502-1623).—<i>History of Council of Trent</i>—Philosophical and historical.</p>	<p><b>Gudbrand Thorlaksson</b> (Ic.). (1584).—<i>Translation of Bible</i>—Unwarmed author and translator of religious works.</p>	

TABLE V. SEVENTEENTH CENTURY, 1600-1700

ENGLISH	GERMAN	FRENCH	SCANDINAVIAN	ITALIAN, SPANISH, PORTUGUESE	HISTORICAL EVENTS
	<p><b>Jacob Ayer</b> (1605).—<i>Dramas</i>—Constructed under the influence of the English comedians, a new German drama, based on the art of Hans Sachs. He popularized the opera. Sixty-six plays were published in 1618 under the title <i>Opus Theatricum</i>.</p>	<p><i>L'Arcade Patelin</i>—Is the masterpiece of the French theater in the middle ages and it remains to-day as one of the best examples of the comic play and of the Gallic wit.</p> <p><b>François de Malherbe</b> (1555-1628).—<i>Poems</i>—Brought into poetry a harmony and purity of style unknown before him. There is more work than genius in his poems.</p> <p><b>St. François de Sales</b> (1567-1622).—<i>Religious Works</i>—Preacher and writer of religious works whose influence was felt and is still felt by pious minds.</p>	<p><b>Arngrim Jonsson</b> (Ic.), (1568-1648).—<i>History of Iceland</i>—Derived study of Icelandic antiquities.</p> <p><b>Johannes Thomae Bureus</b> (Swed.), (1568-1652).—<i>Book on Runes</i>—Founder of runology. Grammatical works. Busy with old Scandinavian manuscripts.</p> <p><b>Magnus Olafsson</b> (Ic.), (1575-1635).—<i>Dictionary</i>—First Icelandic dictionary.</p>	<p><b>Lope de Vega</b> (Sp.), (1562-1635).—<i>Dramas</i>, <i>Lyrics</i>—Dramas of unusual number, variety, and power.</p> <p><b>Galileo Galilei</b> (It.), (1564-1642).—<i>Scientific</i>—Physical and astronomical discussions.</p> <p><b>Tasso</b> (It.), (1565-1638).—<i>Rape of the Lock</i>—A mock heroic poem.</p> <p><b>Tommaso Campanella</b> (It.), (1568-1639).—<i>Philosophy</i>—Philosophical and political.</p> <p><b>Galileo de Castro</b> (Sp.), (1569-1631).—<i>Dramas</i>—His <i>Youth of the Cid</i> furnished the basis for Corneille's <i>Cid</i>.</p>	
<p><b>Ben Jonson</b> (1574-1637).—<i>Dramas</i>—A scholar and man of letters. A learned constructor of plays, had also the true lyrical faculty.</p> <p><b>John Fletcher</b> (1576-1633).—<i>Francis Beaumont</i> (1596-1616).—<i>Dramas</i>—Well constructed plays, but of a low moral tone.</p> <p><b>Robert Burton</b> (1577-1640).—<i>Anatomy of Melancholy</i>—Full of out-of-the-way learning and quotations bearing on the subject.</p>	<p><b>Jacob Boehme</b> (1573-1624).—<i>Mysticism</i>—The founder of the mystical theosophy of the century.</p>	<p><b>Mathurin Régnier</b> (1573-1613).—<i>Satires</i>—His poems, few in number, are imitated from the ancients. He borrowed also considerably from the Italian satirists.</p>		<p><b>Gomes de Quevedo</b> (Sp.), (1580-1645).—<i>Satires</i>, <i>Tragedies</i>, <i>Novels</i>, <i>Poems</i>—Political and religious prose; humorous and satirical works.</p>	
<p><b>Robert Herrick</b>, (1591-1633).—<i>Poems</i>—Lyrics, many of them of charming quality and ingenious construction.</p>	<p><b>Johann Lauremberg</b> (1596-1658).—<i>Satirical Poems</i>—A patriotic satirist of the customs, language and dress of his time, especially of imitation of the French.</p>	<p><b>Hugo Grotius</b> (Dutch), (1563-1645).—<i>Law</i>, <i>Philosophy</i>, <i>Translations</i>—Famous scholar and statesman. Modest, pious, gentle, generous.</p>	<p><b>Anders Arrebo</b> (Dan.), (1587-1637).—<i>Poetic version of David's Psalms</i>, <i>Hexameron</i>—Flourish language. Good description of nature. Alexandrine, mythological references.</p>	<p><b>John Smith</b> (1580-1631).—<i>A True Relation of Virginia</i>—A romantic recital of thrilling adventures.</p> <p><b>William Bradford</b> (1580-1657).—<i>History of Plymouth Plantation</i>—A full and clearly written account to 1646.</p>	<p>1572. Massacre of St. Bartholomew.</p>
<p><b>George Herbert</b> (1593-1633).—<i>The Temple</i>—Inspired by a devotional spirit and an æsthetic spiritualism.</p>	<p><b>Friedrich von Spee</b> (1591-1635).—<i>Lyrics</i>—Von Spee and Johann Scheffler were exponents of the Catholic religious lyric.</p>	<p><b>Racine</b> (1589-1670).—<i>Pastoral Poems</i>—A poet full of a melancholy charm, highly appreciated by his contemporaries.</p>		<p><b>John Winthrop</b> (1590-1649).—<i>History of New England</i>—A simple, personal narrative, with occasional freshness of style.</p>	<p>1588. Defeat of the Spanish armada.</p>

TABLE V. SEVENTEENTH CENTURY—Continued

ENGLISH	GERMAN	FRANCE	SCANDINAVIAN	ITALIAN, SPANISH, PORTUGUESE	AMERICAN	HISTORICAL EVENTS	
<b>Isaac Walton</b> (1593-1633).— <i>The Complete Angler</i> .—From of a delightful character, full of simple piety and love of outdoor nature.		<b>Gues de Balzac</b> (1594-1654).— <i>Éloquent Prose</i> .—His somewhat rhetorical but elegant and harmonious style had an excellent influence on the progress of the language.	<b>Gustavus Adolphus</b> (Swed.), (1594-1632).— <i>Speeches, History, Hymns</i> .—Hero of Thirty Years' war. Intended to write also about his own life and reign, but did not get beyond Karl IX.				
	<b>Martin Opitz</b> (1597-1639).— <i>Criticisms, Translations, Poems</i> .—Translated from Greek, Latin and Italian, and set up fixed principles of poetic art. He has been called "the father of German poetry."	<b>René Descartes</b> (1596-1650).— <i>Philosophy</i> .—The founder of the school of philosophy, based upon reason, known under the name of <i>Cartesianism</i> . Besides being a great philosopher, Descartes made remarkable scientific discoveries.	<b>Georg Stiernhelm</b> (Swed.), (1598-1672).— <i>Western Languages, and Mathematica, Poems</i> .—Introduces a new period in literature. Earliest Swedish sonnets. Great linguist, great erudite poet.	<b>Calderón</b> (Sp.), (1600-1681).— <i>Dramas</i> .—Dramas with love, jealousy and honor as motives.	1600. Martyrdom of Giordano Bruno.		
<b>Sir Thomas Browne</b> (1603-1682).— <i>Pseudopythia, Theology</i> .—One of the most learned men of his time. His style exerted a great influence on Charles Lamb.	<b>H. M. Moscherosch</b> (1601-1690).— <i>Novels, Poems</i> .—Represents the transition from satire to novel under Spanish influence.	<b>Jean de Mairac</b> (1604-1665).— <i>Tragedies</i> .—His <i>Sophonisbe</i> and <i>Cleopatra</i> are the first tragedies adhering strictly to the unities.	<b>Lars Vivaldus</b> (Swed.), (1605-1669).— <i>Lyrics</i> .—Love of liberty and nature. Long imprisoned.		1603. England and Scotland united under James I.		
	<b>Friedrich von Logau</b> (1605-1635).— <i>Epigrams</i> .—This great epigrammatist wrote 3000 German epigrams. Some were translated by Longfellow.	<b>Pierre Corneille</b> (1606-1684).— <i>Tragedy, Comedy</i> .—Called the "Father of French tragedy." Among his tragedies but one is ranked among the masterpieces of the world's literature: <i>Le Cid, Horace, Cinna and Polyeucte</i> . He was also the author of the best comedy written until then (1642): <i>Le Menteur</i> .					
<b>Thomas Fuller</b> (1608-1661).— <i>Church History of England</i> .—A chronicle, with passages of wit or natural pathos.	<b>Paul Gerhardt</b> (1607-1676).— <i>Hymns and Poems</i> .—After Luther the greatest hymn-writer of the Lutheran church, and like Luther modeled his hymns on the popular ballads.	<b>Mlle. de Scudéry</b> (1607-1701).— <i>Novels</i> .—One of the leaders of the "Précieuses" and called by them the "Tenth Muse." She published a number of voluminous novels which contain many interesting allusions to the events of her days. The best known of these novels is <i>Artamène, ou le grand Cyrus</i> .			1607. Jamestown, Va. founded.		
<b>John Milton</b> (1608-1674).— <i>Areopagitica, L'Allegro, Il Penseroso, Comus, Paradise Lost, Paradise Regained</i> , etc.—A poet, grave, learned, of mental dignity but gifted with musical power as much as Shakespeare.		<b>Paul Sarrasin</b> (1610-1665).— <i>Comic Plays, Poems</i> .—Author of a number of witty, burlesque poems. His widow became the famous Madame de Maintenon.		<b>Antonio de Solis</b> (Sp.), (1610-1666).— <i>Conquest of Mexico</i> .—An eloquent spirited account of Cortes in Mexico.		1610, Galileo discovered Satellites of Jupiter.	
<b>Samuel Butler</b> (1612-1680).— <i>Hudibras</i> .—A rhyming jingle, destitute of elevation but with here and there a witty couplet. A classic Puritan throughout. A favorite book of Charles II.	<b>Andreas Gryphius</b> (1616-1664).— <i>Novels</i> .—The German Shakespeare of the seventeenth century. His best work is in his comedies.	<b>Francis de la Rochefoucauld</b> (1613-1690).— <i>Maxims, Memoirs</i> .—His maxims, full of bold paradoxes, give him a lasting reputation. He asserts that the love of self is the only motive for all human actions.	<b>Hallgrím Pjettersson</b> (Ic.), (1614-1674).— <i>Poems</i> .—Printed about 40 times. Clear revelations in a northern tongue of the spirit of reformation.		<b>Anne Bradstreet</b> (1612-1672).— <i>The Tenth Muse</i> .—As affected and cumbersome didactic poem.		
<b>Jeremy Taylor</b> (1613-1667).— <i>Holy Living, Holy Dying</i> , etc.—"The Shakespeare of Divines." Passages of rare poetic beauty and oratorical volume.							
<b>Richard Baxter</b> (1615-1691).— <i>Saint's Rest</i> .—One of the <i>Yoda</i> mummies of the later Puritans, earnest and sincere.	<b>Philipp von Zezen</b> (1619-1689).— <i>Novels</i> .—Showed original talent as translator of the novel of gallant adventure.	<b>Jean de la Fontaine</b> (1621-1695).— <i>Fables, Contes</i> , etc.—The <i>Contes</i> , inspired by Ariosto and Boccaccio, although full of wit are too often indecorous. The reputation of the poet rests on his remarkable <i>Fables</i> which won for him the surname of "The Inimitable."	<b>Stefan Olafsson</b> (Ic.), (1620-1688).— <i>Poems</i> .—Lyric, ironic, satirical, moralizing.			1618-38. Thirty Years' war.	
<b>John Evelyn</b> (1620-1706).— <i>Diary</i> .—Of inestimable value, as it covers seventy years of dramatic English history.	<b>Christoffel von Grimmelshausen</b> (1621-1669).— <i>Novels</i> .—The most important novelist of the period. <i>Simplicissimus</i> , the first great rogue novel in German literature, deals with the vicissitudes of the Thirty Years' war.	<b>Molière (Jean B. Poquelin)</b> (1622-1673).— <i>Comedies, Le Misanthrope</i> , etc.—The greatest writer of comedies not only of his time but of all times. He has not been equaled in France, perhaps not in any country, and he is placed by common consent among the great men of genius who belong to the world.					
		<b>Blaise Pascal</b> (1623-1662).— <i>Philosophy, Mathematica</i> .—Not only a great mathematician but also a thinker and a philosopher. His <i>Pensées</i> (Thoughts), though he did not finish enough to finish, and his <i>Lettres</i> remain as models of French literature.					

TABLE V. SEVENTEENTH CENTURY—Continued

ENGLISH	GERMAN	FRENCH	AMERICAN	HISTORICAL EVENTS
		<p><b>Mme. de Sévigné (1626-1696).</b>—<i>Letters</i>—Her charming familiar letters written to her daughter give interesting information on the court life of her time.</p> <p><b>Jacques Bossuet (1627-1704).</b>—<i>Sermons, etc.</i>—The greatest orator and the greatest writer of his time. reached absolute perfection of oratorical style.</p> <p><b>Charles Ferault (1626-1703).</b>—<i>Stories for Children</i>—His stories are known all over the world and have immortalized his name.</p> <p><b>Louis Bourdaloue (1632-1704).</b>—<i>Sermons</i>—A severe and austere preacher. The strength of his reasoning has made his sermons famous.</p> <p><b>Mme. de La Fayette (1634-1693).</b>—<i>Novels</i>—Replaces the bombastic style of the pastoral of the time by a real language.</p> <p><b>Nicolas Boileau (1636-1711).</b>—<i>Epistles, Art, Poétique, Satires</i>—These works stamp him as a real poet and as a great critic. He did much to elevate the literature of the century.</p> <p><b>Malebranche (1638-1715).</b>—<i>Philosophy</i>—Whatever may be the opinion of his theology, his rich and poetical style cannot be denied, and he is considered a great writer.</p> <p><b>Jean Racine (1639-1699).</b>—<i>Tragedy</i>—brought the French classic tragedy to its perfection. He understood men better than Corneille and consequently his tragedies are more human. It has been said that Racine painted men as they are, and Corneille as they should be.</p> <p><b>Jean de La Bruyère (1645-1696).</b>—<i>Character Studies</i>—Above all a moralist who in his <i>Characteres</i> satirized without mercy his surroundings.</p> <p><b>François de La Motte Fénelon (1651-1715).</b>—<i>Télémaque, etc.</i>—Was not equalled in his century for the charm of his style. Less vigorous than his rival Bossuet, the influence of his sermons and his religious works was not less great.</p> <p><b>Jean François Regnard (1655-1709).</b>—<i>Comedies in Verse</i>—His comedies, especially <i>Le Joueur</i>, show a decided comic talent.</p>		
		<p><b>SCANDINAVIAN</b></p> <p><b>Olof Rudbeck (Swed.) (1630-1702).</b>—<i>Atlantica, Works on Botany and Anatomy</i>—Very famous in anatomy. <i>Atlantica</i>, fanciful, represents the north as cradle of civilization.</p> <p><b>Feder Sjö (Dan.) (1631-1712).</b>—<i>Collection of Proverbs</i>—Promoted study and use of Danish instead of Latin. Wrote first Danish grammar.</p> <p><b>Thomas Kingo (Dan.) (1634-1703).</b>—<i>Hymns</i>—Denmark's most favorite hymn-writer and one of the world's best.</p> <p><b>Thorvald Torfæus (Ic.) (1636-1719).</b>—<i>History of Norway</i>—A revolutionizing history.</p> <p><b>Niels Stensen (Dan.) (1638-1686).</b>—<i>Mineralogy</i>—Finest work on subject ever written. Great student of anatomy.</p> <p><b>Lars Johansson (Swed.) (1638-1674).</b>—<i>Lyrics</i>—Drinking songs, songs of love, casual poems.</p> <p><b>Samuel Columbus (Swed.) (1642-1679).</b>—<i>Works on Grammar, Poems, Hymns</i>—Unusually melodious.</p> <p><b>Harin Spögel (Swed.) (1645-1714).</b>—<i>Glossarium Svedicobæum, Poems, Hymns</i>—Wrote <i>Gåde Verk och Hris</i>, religious, didactic poem. Best as writer of hymns.</p>	<p><b>ITALIAN</b></p> <p><b>Henry Norwood (1628-1670?)</b>—<i>A Voyage to Virginia</i>—Surprisingly well written in parts, and informative.</p> <p><b>Michael Wigglesworth (1631-1708)</b>—<i>The Day of Doom</i>—A poem on the day of judgment, according to the views of the time.</p>	<p>1625. Charles I., king of England.</p> <p>1628. Gustavus Adolphus killed at battle of Lützen.</p> <p>1634. Wallenstein assassinated.</p> <p>1642. English civil war.</p> <p>1649. Charles I. of England beheaded.</p> <p>1660. Restoration of the Stuarts.</p>
<p><b>John Bunyan (1628-1688).</b>—<i>Pilgrim's Progress, Holy War</i>—Simple, idiomatic, with passages of rare beauty. Animated by simple, natural piety. A classic too much neglected.</p> <p><b>John Dryden (1631-1700).</b>—<i>Virgil Translated, St. Cecilia's Day, etc.</i>—A fine critic. The father of fluent prose. Many energetic lines of verse, especially in his satires. A man of fine talent but limited genius.</p> <p><b>John Locke (1632-1704).</b>—<i>Essay on Human Understanding, Thoughts on Education, etc.</i>—A sound, practical thinker, whose works illustrate the common sense and unspiritual tone of his age.</p> <p><b>Samuel Pepys (1633-1703).</b>—<i>Diary</i>—His diary, not intended to be public, throws light on the life and habits of a capable business man of the eighteenth century.</p> <p><b>Str Isaac Newton (1642-1727).</b>—<i>Principia, etc.</i>—A great mathematician, he laid the foundation of our understanding of the mechanical structure of the universe.</p>	<p><b>Caspar von Lohenstein (1635-1683).</b>—<i>Drama, Novels</i>—Represents the decline of German Renaissance. Traveled in themes of blood, incest, and cruelty.</p> <p><b>Christian Weise (1642-1708).</b>—<i>Plays, Novels</i>—Schoolmaster poet of Zittau, wrote after the manner of the Latin school dramas. He marks an advance by introducing fresh characters from the life about him and employing an unutilized style.</p> <p><b>G. W. Lethnitz (1646-1710).</b>—<i>Philosophic Wirfungen</i>—The first great scientific German philosopher of the modern type, sought to reconcile spirit and matter. Chief works deal with the goodness of God, the liberty of man, the origin of crime, and his theory of monads, or atoms.</p> <p><b>Christian Thomasius (1655-1728).</b>—<i>First German Monthly</i>—Sought to bring universal enlightenment into the vernacular into close touch with national life. Delivered the first of university lectures ever given in the German tongue.</p>			

TABLE VI. EIGHTEENTH CENTURY, 1700-1800

ENGLISH	GERMAN	FRENCH	AMERICAN	ITALIAN, SPANISH, SCANDINAVIAN	HISTORICAL EVENTS
<b>Daniel Defoe</b> (1661-1731).— <i>Robinson Crusoe</i> —A born story-teller and pamphleteer.			<b>James Blair</b> (1656-1742).— <i>Sermons, No Cross No Crown</i> —Comparatively modern prose, written with pious zeal.		
<b>Jonathan Swift</b> (1667-1745).— <i>Tale of a Tub, Gulliver's Travels</i> —Un- equaled as a satirist and writer of allegories in simple, nervous, idiomatic English.		<b>Jean Massillon</b> (1663-1742).— <i>Orations</i> —One of the great French sacred orators. He lives in his <i>Petit Carême</i> .	<b>Cotton Mather</b> (1663-1728).— <i>Blay of Rev. Nathaniel Collins, Sermons</i> , etc.—Voluminous sentimental writings of "pedantic and fantastic quaintness."		
<b>Joseph Addison</b> (1673-1719).— <i>Essays</i> —Originator of the social essay, marked by kindly, gentlemanlike humor in the urbane style.		<b>Aleais René Le Sage</b> (1668-1747).— <i>Gil Blas, Comedies</i> —Best known as the author of <i>Gil Blas</i> , a satirical novel, and the first one to depict truly the manners of society.		<b>G. Battista Vico</b> (It.), (1668-1744).— <i>Scienza Nuova</i> —Metaphysical and scientific.	
<b>Sir Richard Steele</b> (1672-1729).— <i>Essays</i> —Established the <i>Tatler</i> . A good second to Addison.			<b>William Byrd</b> (1674-1744).— <i>The Dying Lane and other tracts</i> —Full of fresh humorous observations on life.		1665. Great fire of London.
	<b>Christian von Wolff</b> (1679-1754).— <i>Philosophical Writings</i> —The modern scholastic who popularized philosophy and brought rationalism to bear upon theology.	<b>Duc de Saint Simon</b> (1675-1755).— <i>Memoirs</i> —An original and powerful writer whose memoirs are a rich mine for those who study the period in which he lived.	<b>Robert Beverly</b> (1675-1716).— <i>History of Virginia</i> —A straightforward narrative of slightly polemic purpose.	<b>Scipione Maffei</b> (It.), (1675-1755).— <i>Dramas</i> —His <i>Mezope</i> is the first classic Italian tragedy.	1675. Greenwich observatory founded.
<b>Bishop Berkeley</b> (1684-1753).— <i>Philosophy</i> —A very acute thinker, English founder of one form of idealism.		<b>Philippe Destouches</b> (1680-1754).— <i>Comedies in Vers</i> —His <i>Le Glorieux</i> is an excellent comedy of manners and the best of his plays.		<b>Ludvig Holberg</b> (Dan.), (1684-1754).— <i>Comedies, Historical Works, Philosophy, Comic Poetry</i> —Founder of Danish drama. Satirical comedy. Natural language of daily life. Fine picture of Copenhagen life.	
<b>Alexander Pope</b> (1686-1744).— <i>Poems</i> —The model poet of his time and century. Imparted to the couplet vigor, pungency, and some variety.			<b>Emanuel Swedenborg</b> (Swed.), (1686-1772).— <i>Philosophy</i> —Prominent seer. Founder of religious sect with adherents chiefly in England and America.		1688. English revolution.
<b>Samuel Richardson</b> (1689-1761).— <i>Novels: Clarissa Harlowe, Pamela, Sir Charles Grandison</i> —Founder of the sentimental moral novel, and gifted with the story-telling faculty.		<b>Aleais Firou</b> (1689-1773).— <i>Comedies in Vers</i> —The many superior qualities displayed in his poetical works are spoiled by the licentious nature of some of them. His best comedy <i>La Métempsé</i> , is one of the masterpieces of the French theater.			
<b>Bishop Butler</b> (1692-1752).— <i>Natural and Revealed Religion</i> —The orthodox moralist of his day, ponderous in style and common-place in method.	<b>J. C. Guenther</b> (1695-1723).— <i>Leyce</i> —A lyric poet of personal feeling, modeling his lyrics upon the ballad, and thus the forerunner of Goethe.	<b>Voltaire (François Marie Arouet)</b> (1694-1778).— <i>History, Letters, Philosophy, Poems, Dramas</i> , etc.—The greatest literary genius of the eighteenth century. Poet, historian, political and satirical writer, philosopher, writer of tragedies, he excelled in every branch of literature. His works fill from 75 to 80 volumes.		<b>H. A. Brorson</b> (Dan.), (1694-1764).— <i>Hymns</i> —Wrote some of the best Danish hymns.	
<b>Henry Carey</b> (1700-1743).— <i>Poems; Sally in Our Alley</i> , etc.—A light gift of doggerel nature.	<b>J. Bodmer</b> (1698-1783).— <i>Criticism, Translations</i> —Attacked Gottsched for subordinating the poet's imagination to the understanding, and finally wrought the latter's downfall.			<b>Pietro Metastasio</b> (It.), (1698-1782).— <i>Musical Dramas</i> —Lyric smoothness of melody.	1697. Peace of Ryswick.
<b>James Thomson</b> (1700-1748).— <i>The Seasons</i> , etc.—A delicate feeling for the quieter aspects of nature, harmoniously expressed.	<b>J. C. Gottsched</b> (1700-1766).— <i>Dramas, Criticism</i> —For twenty years literary dictator in Leipzig, sought to reform the German drama on the model of the French, but insisted upon historic costume, and banished the clown from tragedy.		<b>Jonathan Edwards</b> (1703-1766).— <i>Sermons, Surprising Conversions</i> , etc.—Strong and highly imaginative proclamations of Calvinism.	<b>Ignacio de Llanos</b> (Sp.), (1704-1789).— <i>Art of Poetry, Poems</i> —Helped introduce French influence in Spanish.	
		<b>Benjamin Franklin</b> (1706-1790).— <i>Poor Richard's Almanac, Autobiography</i> —Wise and sagacious utterances of a fair, avowed utilitarian.		<b>Finn Jonsson</b> (Ic.), (1704-1789).— <i>Revised History of Iceland</i> —Last of royal dynasties. History up to 1740.	1704. Boston New Letter established.



TABLE VI. EIGHTEENTH CENTURY—1700 to 1800—Continued

ENGLISH	GERMAN	FRENCH	SCANDINAVIAN	ITALIAN, RUSSIAN	HISTORICAL EVENTS
<b>Henry Fielding</b> (1707-1754).— <i>Tom Jones, Amelia, Jonathan Wild</i> , etc.—The first great realistic novelist. Depicts life broadly and faithfully.		<b>Comte de Buffon</b> (1707-1788).— <i>Natural History</i> .—A great naturalist and a writer whose style still serves as a model.	<b>Karl von Linné</b> (Swed.) (1707-1788).— <i>Botany, Travels</i> .—Founder of science of botany. Language is naive, expressive, simple, clear.	<b>Carlo Goldoni</b> (It.), (1707-1793).— <i>Comedies</i> .—Animated character comedy, mostly in prose.	
<b>Samuel Johnson</b> (1709-1784).— <i>Dictionary</i> .— <i>Rasselas, Lives of the Poets, Vanity of Human Wishes</i> .—A man great in eighteenth century learning and letters. The critical authority of his day.	<b>Friedrich von Hagedorn</b> (1709-1754).— <i>Anacreontic Lyrics, Fables</i> .—Essentially a social poet. He gives the dominant tone to the German lyric for twenty-five years.	<b>Louis Gresset</b> (1709-1777).— <i>Poems, Comedies</i> .— <i>Vertigier</i> , a popular poem, and <i>Le Méchant</i> , a comedy, are the best known of his works.	<b>Olof von Dalin</b> (Swed.), (1708-1769).— <i>Journalist, History, Comedies, Tragedies, Poems</i> .—Representative beginning of era of French influence. Shows influence of Pope, Addison, Swift, Voltaire.	<b>Prince Antioch Kanemir</b> (Russ.), (1708-1744).— <i>Forme</i> .—Bold satirist of the social life of his own people. Verse form under French influence.	1708. Battle of Oudenarde.
<b>David Hume</b> (1711-1776).— <i>History of England</i> .—The first learned historian of England. A philosopher of science.	<b>Albrecht von Haller</b> (1708-1777).— <i>Science, The Alps</i> .—Great Swiss anatomist and physiologist. Came under the influence of English poets and wrote <i>The Alps</i> in the spirit of the English nature poetry.	<b>Jean Jacques Rousseau</b> (1712-1778).— <i>Fiction, Education</i> .—The world-wide influence of the works of this man cannot be measured.	<b>Dezire Diderot</b> (1713-1784).— <i>Fiction, Encyclopédie</i> (Ed.).—One of the most powerful exponents of the ideas and philosophy of the eighteenth century.	<b>Michail Lomonossov</b> (Russ.), (1711-1765).— <i>Lyrics</i> .—Scholar and poet. Founder of Russian metrics. Grounded in Russian folk-song.	1710. St. Paul's cathedral, London, completed.
<b>Laurence Sterne</b> (1713-1768).— <i>Tristram Shandy, Sentimental Journey</i> .—A writer in whom affection becomes an art. Some pathetic passages have become classic.		<b>Etienne de Condillac</b> (1715-1780).— <i>Metaphysics</i> .—A friend of Rousseau and Diderot, and, as a philosopher, for a long time a disciple of Locke. His <i>Traité on Sensations</i> put him at the head of the "Sensualists" school.			1717. Alliance between France, England and Holland.
<b>Thomas Gray</b> (1716-1771).— <i>Elegy in a Country Churchyard</i> , etc.—A scholar-poet. Production limited but of fine workmanship.	<b>C. F. Gellert</b> (1715-1779).— <i>Novels, Letters, Poems</i> .—A poet of the people. Great stylist as letter writer. His Swedish <i>Countess of G.</i> is the first novel written in Germany.	<b>Ewald von Kietel</b> (1715-1759).— <i>Nature Poetry, War Odes</i> .—A Prussian military officer. Influenced in his poetry by Thomson. A spirit of melancholy unites with his passionate love for nature.			
<b>John Smollett</b> (1721-1771).— <i>Humphrey Clinker, Roderick Random</i> , etc.—Originator of the sea-story. Inclined to vulgar coarseness.	<b>J. J. Winckelmann</b> (1717-1768).— <i>History of Ancient Art</i> .—His work opened a new epoch in the history of art, and marked the beginning of modern archaeology as a branch of science.	<b>Ernst von Kietel</b> (1715-1759).— <i>Nature Poetry, War Odes</i> .—A Prussian military officer. Influenced in his poetry by Thomson. A spirit of melancholy unites with his passionate love for nature.			
<b>John Smollett</b> (1721-1771).— <i>Humphrey Clinker, Roderick Random</i> , etc.—Originator of the sea-story. Inclined to vulgar coarseness.	<b>J. W. L. Gleim</b> (1717-1803).— <i>Anacreontic Lyrics, Grenadier Songs</i> .—A mediocre poet of love and wine and of war-songs, best known as a generous patron of needy poets.	<b>Jean François Marmontel</b> (1723-1799).— <i>Novels, Tragedies</i> .—Also a noted encyclopedist.	<b>Gerhard Suhm</b> (Nor.), (1722-1780).— <i>History of Norway</i> .—Wrote a work on the north to 1400 in 14 volumes.	<b>Carlo Gozzi</b> (1722-1806).—Italian dramatist.	
<b>John Smollett</b> (1721-1771).— <i>Humphrey Clinker, Roderick Random</i> , etc.—Originator of the sea-story. Inclined to vulgar coarseness.	<b>F. G. Klopstock</b> (1724-1803).— <i>Messiah, Lyrics, Odes</i> .—The first genuine poet of the eighteenth century. Inspired by Milton's <i>Paradise Lost</i> , he wrote his <i>Messiah</i> . He was also a great lyric poet.		<b>Björn Halderson</b> (Ic.), (1724-1794).— <i>Dictionary</i> .—Originally an Icelandic-Latin dictionary, but published for the first time in 1814 with Danish meanings by R. Hask.		
<b>John Smollett</b> (1721-1771).— <i>Humphrey Clinker, Roderick Random</i> , etc.—Originator of the sea-story. Inclined to vulgar coarseness.	<b>G. E. Lessing</b> (1729-1781).— <i>Criticism, Plays</i> .—The greatest critic of Germany. Turned the minds of the Germans from the French stage to Shakespeare and German folk-drama. Introduced the English comedy of common life, developed a new type of national German tragedy, and preached the evangel of brotherhood and religious toleration.		<b>F. F. Suhm</b> (Dan.), (1728-1798).— <i>History of Denmark</i> .—In 14 volumes ending with the year 1400. Characteristic ponderousness of age.		
<b>John Smollett</b> (1721-1771).— <i>Humphrey Clinker, Roderick Random</i> , etc.—Originator of the sea-story. Inclined to vulgar coarseness.			<b>C. R. Tullin</b> (Nor.), (1728-1780).— <i>Poems</i> .—Poems describing nature and didactic poems. Influenced by Thomson and Pope. Too much detail in description.		
<b>John Smollett</b> (1721-1771).— <i>Humphrey Clinker, Roderick Random</i> , etc.—Originator of the sea-story. Inclined to vulgar coarseness.				<b>Giuseppe Parini</b> (It.), (1729-1799).— <i>Poems, Odes</i> .—His <i>Giorno</i> is one of the best works in Italy in the eighteenth century.	1727. George II. king of England.

TABLE VI. EIGHTEENTH CENTURY—Continued

ENGLISH	GERMAN	FRENCH	SCANDINAVIAN	ITALIAN, SPANISH, RUSSIAN, AMERICAN	HISTORICAL EVENTS
<b>William Cowper</b> (1731-1800).— <i>The Task, John Gilpin</i> , etc.—Diverts poetry of the affections of Pope. Writes on simple themes.	<b>Solomon Gessner</b> (1730-1788).— <i>Idylls, Pastorals</i> .—His <i>Idylls</i> the most popular German book in Europe before the appearance of <i>Werther</i> . His prose is delicately halcyon, but very artificial.	<b>A. de Beaumarchais</b> (1732-1799).— <i>Comedies</i> .—Celebrated especially for his two witty and well constructed plays, <i>Le Barbier de Séville</i> and <i>Le Mariage de Figaro</i> , in which we find much of the spirit that is coming with the French revolution.	<b>Gustav Filip Creutz</b> (Swed.), (1731-1785).— <i>Poems</i> .—Idyllic poetry. Tender in personality and expression. Delights of nature and of love.	<b>Girolamo Tiraboschi</b> (It.), (1731-1794).— <i>Literary History</i> .—A valuable history of Italian literature.	
	<b>C. M. Wieland</b> (1733-1813).— <i>Novels</i> .—Best known as author of the novels <i>Don Sylvio</i> of describing his transition from pietism to nature poetry; <i>Agathon</i> , giving his views of the antique; and the metrical romance <i>Oberon</i> , treating of the adventures of Hagen of Bordeaux.		<b>Gustav Fredrik Gyllenberg</b> (Swed.), (1731-1808).— <i>Poems</i> .—Best in didactic and satirical poetry. Wrote also fables and an epic.	<b>Ramón de la Cruz</b> (Sp.), (1731-1799).— <i>Dramas</i> .—Short farces of everyday life.	
	<b>Immanuel Kant</b> (1724-1804).— <i>Critical Philosophy</i> .—The greatest German philosopher. Substituted critical philosophy for the old dogmatic metaphysics, demanded obedience to the moral law, laid the foundations of modern aesthetics. He was the founder of the transcendental philosophy.	<b>Bernardin de St. Pierre</b> (1737-1814).— <i>Paul and Virginia</i> . This popular work brings into French literature the taste for "nature" as it is. St. Pierre was in literature a disciple of J. J. Rousseau.		<b>George Washington</b> (1732-1799).— <i>Farwell Address, State Papers</i> , etc.—Broadly patriotic and well-considered.	
<b>Edward Gibbon</b> (1737-1794).— <i>Decline and Fall of the Roman Empire</i> .—A painstaking and learned historian. Constructive powers of broad scope.				<b>Thomas Godfrey, Jr.</b> (1736-1768).— <i>The Prince of Parthia, Poems</i> .—Imitative but original in imagination and marked by color.	1734. University of Göttingen founded.
<b>James Boswell</b> (1740-1795).— <i>Life of Samuel Johnson</i> .—The true reporter's instinct for the point of a story. Otherwise a lousy.				<b>Patrick Henry</b> (1736-1799).— <i>Speeches, Letters</i> , etc.—Eloquent, ardent, and profoundly impressive.	
<b>William Paley</b> (1743-1805).— <i>Evidence of Christianity, Natural Theology</i> .—A cogent reasoner on the old premises.	<b>J. G. von Herder</b> (1744-1803).— <i>History</i> .—The chief factor in the literary revolution known as "naturalism." His work in history sets forth the evolution of human institutions.		<b>Karl Mikael Bellman</b> (Swed.), (1740-1795).— <i>Songs, Lyrics</i> .—Bubbling joy of life. Fluent writer. Wrote just to amuse. Musical. Very popular.	<b>Thomas Paine</b> (1737-1809).— <i>The Crisis, Common Sense, Rights of Man, Age of Reason</i> , etc.—Journalistic and talented, and generally effective.	
<b>Hannah More</b> (1745-1833).— <i>Coleridge in Search of a Wife, Sacred Dramas</i> .—Something of a minor poet, something of a dramatist and story-teller.			<b>J. M. Wessel</b> (Nor.), (1742-1785).— <i>Poems, Plays</i> .—Effective parody of dramas of the day, which were written in French style. Elegant language. <i>Love Without Sins</i> is his best known work.	<b>Gabriel Doroshawin</b> (Russ.) (1748-1816).— <i>Lyrics, Odes</i> , etc.—His ode <i>To God</i> translated into all European languages. Rhetorical but a strong poetic vein.	1740. Reign of Frederick the Great begins.
<b>Jeremy Bentham</b> , (1748-1832), <i>Philosophy, Essays</i> .—Greatest critic of legislation and government in his day.	<b>Johann Wolfgang von Goethe</b> (1749-1832).— <i>Dramas, Lyrics, Elegies, Sonnets, Epigrams</i> .—The greatest German poet. A universal genius. Before 1800 he had imitated Shakespeare, Ossian, Goldsmith and the ballad poetry, sung ode in the manner of Pindar and Klopstock, lived his story of <i>Werther</i> , and created a new German classicism in <i>Phigorie, Tasso</i> , and <i>Herzmann and Dorothea</i> . His life poem, <i> Faust</i> , is based upon the doctrine of redemption by ceaseless striving, and typifies the philosophical struggle of the poet's own life.	<b>Comte Mirabeau</b> (1749-1791).— <i>Orations</i> .—The greatest orator of the French revolution. His speeches have been published and are his principal title to literary distinction.	<b>Klaus Fasting</b> (Nor.), (1746-1791).— <i>Poems</i> .—Famous for critical essays and epigrams. Admired of French literature.	<b>Vittorio Alfieri</b> (It.), (1749-1803).— <i>Tragedies</i> .—Classical in spirit, observing the unities.	
<b>Richard B. Sheridan</b> , (1751-1816), <i>The Rivals, School for Scandal, Speeches</i> , etc.—Writer of witty dialogue and constructor of telling stage situations. Comedy still acted.	<b>William Blake</b> , (1757-1827), <i>Songs of Innocence, Songs of Experience</i> .—The single Englishman of supreme and simple poetic genius of his time.		<b>Edw. Storm</b> (Nor.), (1749-1794).— <i>Poems</i> .—Author of splendid heroic ballads.	<b>Tomás de Iriarte</b> (Sp.), (1750-1791).— <i>Literary Fables</i> .—Original fables directed toward literary subjects.	
<b>Robert Burns</b> , (1759-1796), <i>Poems</i> .—Lyrics, songs and satires in Scotch dialect, marked by music, pathos and wit.	<b>Friedrich von Schiller</b> (1759-1805).— <i>Drama, Lyrics, History</i> .—The great associate of Goethe. Reflects the ideal yearning of his time. Aimed to lead men to consecrate their gifts to the good, the beautiful, and the true. He is the best-loved poet among the Germans.	<b>Claude Bouquet de Laube</b> (1760-1826).— <i>Mercure, lais</i> .—The immortal national hymn of France.	<b>Johan Henrik Kellgren</b> (Swed.), (1751-1795).— <i>Journalism, Poems, Lyrics</i> and satiric poetry. Most prominent of the literary men who were intimate with Gustaf III.		1755. Earthquake at Lisbon.
	<b>A. von Katschube</b> , (1761-1819).— <i>Plays</i> .—Now almost forgotten, he was the most popular dramatist of his time. His plays are very numerous, and catered to the public taste.	<b>André Chénier</b> (1762-1794).— <i>Lyrics</i> .—A model in purity of form. His style in the lyrics is passionate, but not personal.	<b>Enoch Falen</b> (1755-1808).— <i>Dramas</i> .—His <i>Drogaden</i> enjoyed great popularity.		1756-1763. Seven Years' war.
					1759. Battle of Quebec.

ENGLISH	AMERICAN	FRENCH
<p><b>Maria Edgeworth</b> (1767-1849).—<i>Popular Tales</i>—Stories of middle-class domestic life, of excellent moral tone and some power of characterization.</p>	<p><b>Thomas Jefferson</b> (1743-1826).—<i>Notes in Virginia, Declaration of Independence</i>—Full of wise foresight and keen acumen.  <b>John Marshall</b> (1755-1835).—<i>Life of Washington, Decisions</i>, etc.—Profound and wise, but rather heavy.  <b>Alexander Hamilton</b> (1757-1804).—<i>Contributions to the Federalist</i>—Keen and ingenious, full of information.</p>	<p><b>Xavier de Maistre</b> (1763-1852).—<i>Novels, Essays</i>—Models of vigorous narration. Deserves prominent place among French novelists.  <b>Mme. de Staël</b> (1766-1817).—<i>L'Allemagne, Delphine, Germany</i>, etc.—The first to set forth the principles of the Romantic school. Her book on Germany did much to bring the thought of that country into France.  <b>Benjamin Constant</b> (1767-1830).—<i>Politics, Religion</i>—His works, both on politics and religion, are skeptical in tone. He also wrote <i>Adolphe</i>, a novel of some value.  <b>Jean François Micaud</b> (1767-1839).—<i>History of the Crusades</i>, etc.—The founder of the universal biography.</p>
<p><b>William Wordsworth</b> (1770-1850).—<i>The Excursion, Poems</i>—Nature poems and descriptive poems. Many fine sonnets. First expression of modern feeling for nature.  <b>James Hogg</b> (1770-1835).—<i>Pastorals, Shepherd's Calendar</i>—Scottish verses. One or two lyrics of sweetness and simplicity.  <b>Sir Walter Scott</b> (1771-1832).—<i>Novels, Lady of the Lake, Poems</i>—Originator of the historical novel. Tone natural and wholesome. Secure in the estimation of posterity.  <b>Sidney Smith</b> (1771-1845).—<i>Sermons, Essays</i>—The witty divine. Master of the expository style.  <b>James Montgomery</b> (1771-1854).—<i>Hymns, Poems</i>—A man universally esteemed; best remembered now for his hymns, of which some hundred are found in our hymnals.  <b>Samuel T. Coleridge</b> (1772-1834).—<i>Essays, Hymns of Ancient Mariner, Translation</i>, etc.—A man of remarkable gifts, intellectual and poetic; a keen critic; a natural master of verbal melody.</p>	<p><b>Charles Brockden Brown</b> (1771-1816).—<i>Wieland, Ormond</i>, etc.—Weird and sensational, of the Godwin type.</p>	<p><b>François de Chateaubriand</b> (1768-1848).—<i>Reus, Genesis of Christianity, Atlas</i>, etc.—Undoubtedly the greatest writer of his century, and his influence on the literature of the first half of the nineteenth century is considerable.  <b>Baron de Cuvier</b> (1769-1832).—<i>Natural History</i>—One of the best known French naturalists.  <b>Napoleon I.</b> (1769-1821).—<i>Proclamations, Letters, Memoirs</i>—His letters and his memoirs bear the stamp of the great genius whose characterization cannot be given in this restricted space.</p>
<p><b>Robert Southey</b> (1774-1843).—<i>Biographies of Nelson, Wesley</i>, etc., <i>Poems</i>—A man of industry and worth. Better as a prose stylist than a poet.  <b>Charles Lamb</b> (1775-1834).—<i>Essays of Elia</i>, etc.—A quaint and delicate essayist; a friend of Coleridge.  <b>Walter Savage Landor</b> (1775-1864).—<i>Imaginary Conversations, Count Julian, Heron, Iphigene</i>, etc.—Charming scholar and writer. Lhecture and old-fashioned in his thought but a remarkable stylist.  <b>Jane Austen</b> (1775-1817).—<i>Novels; Pride and Prejudice, Emma</i>, etc.—Her novels depicting upper middle-class life are delightfully realistic and full of quiet humor.  <b>Thomas Campbell</b> (1777-1844).—<i>Pleasures of Hope, Lyrics</i>, etc.—Something of a critic. His lyrics have much vigor and verve.  <b>Henry Hallam</b> (1777-1859).—<i>Europe During the Middle Ages, Constitutional History of England</i>—Strong, vigorous, historical writing from a standpoint now antiquated.  <b>William Hazlitt</b> (1778-1830).—<i>Table Talk, English Poets</i>, etc.—Critical essays; contain some true eloquence, and many powerful phrases.</p>	<p><b>Robert Treat Paine</b> (1773-1811).—<i>Adams and Liberty, Poems</i>—Superficial but of noticeable metrical facility.</p>	<p><b>Charles Fourier</b> (1772-1839).—<i>Socialism</i>—A socialist whose system did not prove practical although it had many followers.</p>
<p><b>Thomas Moore</b> (1779-1852).—<i>Biographies, Lalla-Rookh, Irish Melodies</i>, etc.—Songs of much melody but of an unreal sentimentality.</p>	<p><b>Henry Clay</b> (1777-1852).—<i>Speeches, Letters</i>, etc.—Attractive because of personality and power.  <b>Washington Allston</b> (1778-1843).—<i>Art Lectures, Poems</i>—Highly artistic in intent and achievement.  <b>James Kirk Paulding</b> (1779-1860).—<i>Novels—Romances of little present interest.</i>  <b>Francis Scott Key</b> (1780-1843).—<i>Poems, Star Spangled Banner</i>, etc.—The chief poem is a national song of patriotic ardor.  <b>William F. Channing</b> (1780-1842).—<i>Addresses, Sermons</i>—Social papers, clear, tolerant, thoughtful.  <b>John James Audubon</b> (1780-1851).—<i>Birds of America, Quadrupeds of America</i>—Marked by keen observation and wide interest.</p>	<p><b>Jean Baptiste Biot</b> (1774-1862).—<i>Philosopher and mathematician.</i>  <b>Pierre de Béranger</b> (1780-1857).—<i>Lyrics</i>—His songs, which have great lyric qualities, were very popular in his day and are still valued.</p>

CENTURY, 1800-1900

GERMAN	SCANDINAVIAN	ITALIAN, SPANISH, RUSSIAN	HISTORICAL EVENTS
<p><b>J. G. Fichte</b> (1782-1814).—<i>Philosophic Writings, Orations</i>.—The philosopher of the Romantic school and the exponent of the philosophy of individualism. His great work <i>Addresses to the German Nation</i> helped arouse the revolt against Napoleon.</p> <p><b>Jean Paul Friedrich Richter</b> (1763-1825).—<i>Novels, Eschairs</i>.—United elements of "storm and stress" with Fichte's philosophy. Often represents the idealist in conflict with real life.</p> <p><b>Wilhelm and Alexander von Humboldt</b> (1767-1825 and 1769-1859).—<i>Criticism, Science, Travel</i>.—Great scientists and travelers. Wilhelm, virtual founder of the University of Berlin, was a great classical scholar. Alexander wrote the great masterpiece <i>Cosmos</i>.</p> <p><b>A. W. von Schlegel</b> (1797-1845).—<i>Criticism, Poems</i>.—The great critic of the Romantic school. Gave the Germans his famous lectures on <i>Dramatic Art and Literature</i>, and contributed to their classical translation of Shakespeare, 1797-1810.</p> <p><b>Zacharias Werner</b> (1768-1825).—<i>Plays, Sonnets</i>.—Next to Tieck, the greatest dramatist of the Romantic school.</p> <p><b>F. E. D. Schlegel</b> (1796-1834).—<i>Addresses, Criticism</i>.—The preacher of the Romantic school, famous for his <i>Addresses on Religion</i>, his <i>Monologues</i>, and his <i>Lectures on Lucinde</i>.</p> <p><b>Ernst Moritz Arndt</b> (1769-1860).—<i>Warsongs, Lyrics</i>.—A sturdy patriot. An earnest, religious spirit pervades his work. Most effective in stirring his nation to revolt against Napoleon.</p> <p><b>Friedrich Hebel</b> (1770-1843).—<i>Hyperion, Lyrics</i>.—Devoted to Greek culture. Poetic activity early cut off by insanity. Was the most gifted lyric genius at the close of the century.</p> <p><b>G. W. F. Hegel</b> (1770-1831).—<i>Philosophy</i>.—The philosopher of collectivism and of evolution in history.</p> <p><b>Heinrich Heine</b> (1771-1845).—<i>Novels</i>.—Prolific novelist, social and political reformer. His best novels are written in the spirit of Scott's <i>Waverley Novels</i>.</p> <p><b>Novalis (Friedrich von Hardenberg)</b> (1772-1801).—<i>Novels, Lyrics, Criticism</i>.—The sentimental poet of the Romantic school. His <i>Hymns to the Night</i> contain some of the most spiritual poetry in the German tongue.</p> <p><b>Friedrich von Schlegel</b> (1772-1825).—<i>Criticism, Novels</i>.—Both critic and poet and wrote the greatest novel of the Romantic school, entitled <i>Lucinde</i>, dealing with the limitations of conventional society.</p> <p><b>J. L. Tieck</b> (1773-1853).—<i>Novels, Lyrics</i>.—The most prolific writer of the Romantic school. His <i>Puss in Boots</i> is the best satirical German drama. He is unrivaled in the world of fantasy.</p> <p><b>F. N. J. Schelling</b> (1775-1854).—<i>Philosophy</i>.—A disciple of Spinoza, taught the identity of spirit and nature, and published <i>Philosophy of Nature</i> (1797), <i>The World Soul</i>, (1798) and <i>System of Transcendental Idealism</i> (1800).</p> <p><b>Heinrich von Kleist</b> (1777-1811).—<i>Dramas, Novels</i>.—Poet of a tragic life. The most original dramatist of North Germany. His <i>Prince von Homburg</i> is Prussia's greatest historical drama.</p> <p><b>F. de la Motte Fouqué</b> (1777-1843).—<i>Fables, Lyrics</i>.—A later Romanticist, popularly known for his charming <i>Undine</i> (1811), the story of a water spirit without a soul.</p> <p><b>Clemens Brentano</b> (1778-1842).—<i>Novels, Ballads</i>.—Best known for his work on <i>The Boys' Wonder Horn</i>, the first extensive collection of German ballads.</p> <p><b>Friedrich von Ranke</b> (1781-1873).—<i>Historian</i>.—A voluminous writer.</p>	<p><b>Anna Maria Lenngren</b> (Swed.), (1755-1817).—<i>Poems</i>.—Satire and idyllic, but realities depicted in natural and simple colors. Her poetic career rather too late to show extreme traits of this period.</p> <p><b>J. T. Baggesen</b> (Dan.), (1764-1826).—<i>Novels, Essays, Travel, Lyrics, Rhymed Letters</i>.—Clothed his sparkling wit in most elegant language. Realistic nature.</p> <p><b>Jens Espelein</b> (Ic.), (1760-1836).—<i>History of Iceland 1698-1832</i>.—Twelve large quartos in annalistic form. Valuable as source, but often uncritical.</p> <p><b>Hans Christian Ørsted</b> (Dan.), (1777-1851).—<i>Science</i>.—Discovered electric magnetism.</p> <p><b>Franz Miksaël Frønsén</b> (Swed.), (1772-1847).—<i>Poems, Hymns</i>.—Exquisite lyric poems. Tender in feeling, clear in form.</p> <p><b>Countess Gyldenbourg</b> (Dan.), (1773-1856).—<i>Novels</i>.—Pseudonym. J. L. Heiberg's mother. Describes everyday life in all classes of society.</p> <p><b>Malte Brunn</b> (Dan.), (1775-1826).—<i>Geography</i>.</p> <p><b>J. P. Mynster</b>, (Dan.), (1776-1850), <i>Theology</i>.—One of Denmark's greatest theologians.</p> <p><b>Jens Jakob Børsehus</b> (Swed.), (1779-1848).—<i>Chimistry</i>.—Enjoys world-wide fame.</p> <p><b>Adam Gottlob Oehlenschläger</b> (Dan.), (1779-1850).—<i>Poems, Tragedies</i>.—Very prolific and brilliant writer. Material chiefly from Scandinavia. Wholesomely human. His <i>Helge</i> was model for Tegner's <i>Fritsja's Saga</i>.</p>	<p><b>Carlo G. Battia</b> (It.), (1766-1837).—<i>Histories</i>.—Dignified histories of the American war of independence and of Italy.</p> <p><b>Quar Krylow</b> (Russ.), (1768-1844).—<i>Fables, Odes, Epigrams, Tragedies</i>.—Full of wit and humor. His fables very popular with the Russian people.</p> <p><b>Jean Charles Stendhal</b> (It.), (1773-1842).—<i>Histories</i>.—Extensive history of the literature of the south of Europe.</p> <p><b>Alberto Lista</b> (Sp.), (1775-1841).—<i>Criticism</i>.—Literary criticism of a wholesome nature.</p>	<p>1763. <i>Georgia Gazette</i> established at Savannah.</p> <p>1772. Partition of Poland.</p> <p>1776. Battle of Bunker Hill.</p> <p>1776. American independence.</p>

TABLE VII. NINETEENTH

ENGLISH	AMERICAN	FRANCE
<p><b>Leigh Hunt</b> (1794-1859).—<i>Essays, Sketches, Memoirs, Poems</i>.—A minor poet. A mirror of appreciation rather than of creative power.</p> <p><b>Thomas De Quincey</b> (1785-1859).—<i>Confessions of an Opium Eater</i>, etc.—Passage of magnificent color. A learned man, lacking in sound realistic judgment.</p> <p><b>Lord Byron</b> (1788-1824).—<i>Poems</i>.—Vigorous, eloquent, sardonic, iconoclastic. A great satirist and in many respects a great poet.</p> <p><b>F Percy B. Shelley</b> (1792-1822).—<i>Queen Mab, Adonais, The Sky Lark</i>, etc.—A remarkable gift of lyrical melody. Full of generous impulse and the unbalanced judgment of youth. A genius.</p> <p><b>Capt. Fred Marryat</b> (1792-1848).—<i>Peter Simple, Jacob Faithful</i>, etc.—Boys' stories, but evincing considerable narrative skill.</p> <p><b>Felicita Hemans</b> (1793-1833).—<i>Lyrics</i>.—A minor poet of grace, sweetness and tenderness.</p> <p><b>George Grote</b> (1794-1871).—<i>History of Greece</i>.—A learned and sound historian, but superseded by modern exact research.</p> <p><b>John Keats</b> (1795-1821).—<i>Endymion, Hyperion</i>, etc.—A true poet, dying too young to reach full fruition of his remarkable artistic powers.</p> <p><b>Thomas Arnold</b> (1795-1842).—<i>Roman History, Sermons, Essays</i>.—A man of wide influence as headmaster of Rugby. An historian of the old school.</p> <p><b>Thomas Carlyle</b> (1795-1881).—<i>French Revolution, Cromwell, Sartor Resartus, Essays</i>, etc.—A very great though one-sided man. A prose poet, an historian of insight and industry, impatient of shams.</p> <p><b>Samuel Lover</b> (1797-1868).—<i>Songs, Ballads</i>.—A writer of slap-dash Irish stories and some good songs.</p>	<p><b>John C. Calhoun</b> (1782-1850).—<i>Speeches, Papers</i>, etc.—Foremost in logical thinking and clear exposition.</p> <p><b>Daniel Webster</b> (1782-1852).—<i>Orations</i>.—Elevated in thought and eloquent.</p> <p><b>Thomas Hart Benton</b> (1782-1858).—<i>Thirty Years' View</i>.—Rich and racy observations of wide experience.</p> <p><b>Washington Irving</b> (1783-1859).—<i>Knickerbocker's History of New York, Sketch Book</i>, etc.—Humorous, with delicate sentiment and grace.</p> <p><b>Richard Henry Dana</b> (1787-1879).—<i>Poems: The Buccaneer</i>, etc.—Overambitious and not wholly successful.</p> <p><b>Alexander Campbell</b> (1788-1866).—<i>Religious Debates, Editorials, Sermons</i>, etc.—Innovative in thought, tolerant in spirit, vigorous.</p> <p><b>James Fenimore Cooper</b> (1790-1851).—<i>Leather Stocking Tales, The Spy</i>, etc.—Romantic and overfortunate in coincidence, but readable.</p> <p><b>Jared Sparks</b> (1790-1866).—<i>American Biographies</i>.—Commendable efforts of a pioneer biographer.</p> <p><b>Wm Greene Halleck</b> (1790-1867).—<i>Poems, Marco Bozzaris</i>, etc.—Spirited but overwrought; sometimes graceful.</p> <p><b>Augustus E. Longstreet</b> (1790-1870).—<i>Georgia Scenes</i>.—Freshly humorous and delightfully fresh.</p> <p><b>George Ticknor</b> (1791-1871).—<i>History of Spanish Literature</i>.—Scholarly and authentic.</p> <p><b>John Howard Payne</b> (1792-1852).—<i>Home Sweet Home</i>.—Universal in appeal and satisfying in form.</p> <p><b>Samuel G. Goodrich</b> (1793-1860).—<i>Peter Parley Books</i>.—Popular introductions with a flavor of fiction.</p> <p><b>William Cullen Bryant</b> (1794-1878).—<i>Addresses, Letters, Poems: Thanatopsis</i>, etc.—Dignified and poised, serious and helpful.</p> <p><b>Joseph Rodman Drake</b> (1795-1820).—<i>The Culprit Fay</i>.—Cleverly executed, but ingenuously fanciful.</p> <p><b>James G. Fenwick</b> (1795-1856).—<i>Poems: Prometheus</i>, etc.—Unsustained, though not without positive merits.</p> <p><b>John Pendleton Kennedy</b> (1795-1870).—<i>Seafloor Bore, Horse Shoe Robinson</i>, etc.—Old-fashioned but interesting pictures of southern life.</p> <p><b>William B. Prescott</b> (1796-1859).—<i>Conquest of Peru, Ferdinand and Isabella</i>, etc.—Excellent history, very interestingly told.</p> <p><b>Thomas C. Halliburton</b> (1796-1866).—<i>Satanstoe</i>.—Humorous with the raciness of the soil.</p> <p><b>Hugh Swinotie Legaré</b> (1797-1843).—<i>Addresses, Articles, Letters</i>.—Academic, suited and in good form.</p>	<p><b>Henri Beyle</b> (Stendhal), (1783-1842).—<i>Novels</i>.—His novels <i>Le Rouge et le Noir</i> and <i>Le Chiribien de Parme</i> bring into literature an analysis of one's self more true than the self-presentation of the Romantic school in general.</p> <p><b>François Guizot</b> (1787-1874).—<i>Histories</i>.—His remarkable historical works have founded the school of philosophical history.</p> <p><b>Alphonse de Lamartine</b> (1790-1869).—<i>Poems, History of the Girondists</i>, etc.—The first, in date, of the great poets of the Romantic school. An idealist whose harmonious verses and high ideals have continued to grow in favor.</p> <p><b>Eugène Scribe</b> (1791-1861).—<i>Comedies</i>.—The author of a large number of plays which show more dramatic skill than study of manners or character.</p> <p><b>Victor Cousin</b> (1792-1867).—<i>Philosophy, Metaphysics</i>.—The chief of a school of philosophers called the Eclectics.</p> <p><b>Casimir Delavigne</b> (1793-1843).—<i>Dramas, Elegies</i>.—Author of popular elegies, but especially remembered as a dramatic writer.</p> <p><b>Augustin Thierry</b> (1795-1856).—<i>History of France</i>, etc.—Historian of the Romantic school.</p> <p><b>François Auguste Marie Mignet</b> (1796-1884).—<i>Histories</i>.—Like that of Guizot his history is founded upon a philosophical basis.</p> <p><b>Louis Adolphe Thiers</b> (1797-1877).—<i>French Revolution, History of the Empire</i>, etc.—A great historian and statesman. His histories are realistic and scientific.</p>

## CENTURY—Continued

GERMAN	SCANDINAVIAN	ITALIAN, SPANISH	HISTORICAL EVENTS
<p><b>Archib von Arnim</b> (1781-1831).—<i>Novels, Poems</i>—Like Brentano, a Heidelberg Romanticist, and assisted with the <i>Wander Horn</i>.</p> <p><b>Adelbert von Chamisso</b> (1781-1838).—<i>Peter Schlemihl, Poems</i>—A later Romantic lyricist, wrote ballads and <i>Peter Schlemihl</i>, the story of a man who sells his shadow, and finds his way through the world with seven-league boots; a romantic treatment of the poet's own life.</p> <p><b>Jacob Grimm</b> (1785-1863).—<i>Fairy Tales, Dictionary</i>—With his brother Wilhelm, founder of modern German philology, and compiler of the great German dictionary; known in literature for his large collection of <i>Fairy Tales</i>.</p> <p><b>Ludwig Börne</b> (1786-1837).—<i>Letters from Paris</i>—A Jew from the Frankfurt ghetto. Famous for his <i>Letters</i>, written as a protest against narrowing social limitations.</p> <p><b>Wilhelm Grimm</b> (1786-1859).—<i>Critical Writings</i>—See Jacob Grimm mentioned above.</p> <p><b>A. Justus Kerner</b> (1786-1862).—<i>Lyrics, Sonnets</i>—Famous lyric poet and Romantic mystic. His <i>Sonnets</i> is a collection of mysterious sayings and doings.</p> <p><b>Ludwig Uhland</b> (1787-1862).—<i>Criticism, Ballads</i>—Poet of Romantic type, wrote ballads, historical plays, patriotic poems, and treatises on German legends.</p> <p><b>J. von Eichendorff</b> (1788-1857).—<i>Lyrics, Life of a Good-for-Nothing</i>—The greatest lyric poet of the Romantic movement. Essentially a poet of nature, and the ideal of a free "Wanderleben" is the recurring theme.</p> <p><b>Arthur Schopenhauer</b> (1788-1860).—<i>Philosophy</i>—The philosopher of pessimism. His <i>World as Will and Idea</i> left a deep impression.</p> <p><b>Friedrich Rückert</b> (1788-1866).—<i>Sonnets in Armor, Poems</i>—Poet of the war of Liberation. His <i>Sonnets in Armor</i> recurred with the clank of arms. Also a great interpreter of oriental life and poetry.</p> <p><b>Theodor Körner</b> (1791-1813).—<i>Lyrics and Sword</i>—The young hero-poet, who fell in Lützen's corps in the war of Liberation, immortalized his poetic gift in his <i>Lyrics and Sword</i>, a collection of patriotic lyrics.</p> <p><b>Franz Grillparzer</b> (1791-1872).—<i>Dramas, Lyrics</i>—The greatest Austrian dramatist. He has neither contemporaries nor successors who can be compared to him for classic beauty and depth of human experience. His <i>Waters of the Sea and of Love</i> is a great modern love-tragedy.</p> <p><b>Wilhelm Müller</b> (1794-1827).—<i>Lyrics</i>—Master of the popular lyric. Poet of the German people in a higher degree than any other Romantic singer. His <i>Songs of the Grapes</i> are full of sentimental patriotism for Greek independence.</p> <p><b>August von Platen</b> (1796-1835).—<i>Venetian Sonnets, Poems, Stories</i>—A romantic poet and master among the German romanticists. His drama <i>The Fatal Fork</i> ridiculed the fate tragedy of the time.</p> <p><b>K. L. Immermann</b> (1796-1840).—<i>Novels</i>—A late Romantic writer best known as the author of <i>The Epigones</i>, foreshadowing the tragedy of his own life, and <i>Minchenhausen</i> distinguished for its description of Westphalian peasant life.</p> <p><b>Heinrich Heine</b> (1797-1856).—<i>Lyrics, Short Stories</i>—The greatest lyric poet after Goethe, strongly imbued with Romanticism. Best known as the author of <i>The Journey to the West Mountains</i> (1826), and the <i>Book of Songs</i> (1827).</p>	<p><b>Flan Magnussen</b> (Ic.), (1791-1847).—<i>Mythology</i>—Thorough student of northern antiquities.</p> <p><b>N. M. Petersen</b> (Dan.), (1791-1862).—<i>History, Mythology</i>—Wrote a work on Scandinavian mythology and a history of Danish literature.</p> <p><b>Emile Tegner</b> (Swed.), (1792-1846).—<i>Speeches, Poems, Frithiof's Saga</i>—World-wide renown. Great personality and original poet. Brilliant figure, clear expression. Musical lyric verse. Influenced by German and Greek. Emphasizes Scandinavian mythology.</p> <p><b>Erik Gustaf Geijer</b> (Swed.), (1793-1847).—<i>History, Philosophy, Poems</i>—Very great both as historian and poet. A scholar. His poetry appeals to the people.</p> <p><b>Christopher Hansteen</b> (Nor.), (1794-1873).—<i>Astronomy</i>—Became widely known by his study of the earth's magnetism.</p> <p><b>Bjarne Thoresen</b> (Ic.), (1796-1841).—<i>Poems</i>—Unique poems of love and patriotism. Excellent poems on deceased friends.</p> <p><b>Rasmus Rask</b> (Dan.), (1797-1832).—<i>Grammatical Works</i>—Great scholar in comparative philology. Was the first to publish the so-called Grimm's law.</p> <p><b>B. S. Ingemann</b> (Dan.), (1799-1862).—<i>Novels, Lyrics</i>—Walter Scott of Denmark. Romantic idealization of middle ages.</p> <p><b>Gustaf W. Garmelius</b> (Swed.), (1799-1877).—<i>Historical Novels</i>—In spirit of Walter Scott.</p> <p><b>J. C. Hauch</b> (Dan.), (1799-1872).—<i>Novels, Dramas, Lyrics</i>—A genuine Romanticist of deep moral earnestness. Not very popular. Best are his lyric poems.</p> <p><b>K. F. Dählgrén</b> (Swed.), (1791-1844).—<i>Novels, Short Stories, Poems</i>—At first allegorical and mystical. Later became leading humorist.</p> <p><b>J. L. Heiberg</b> (Dan.), (1791-1860).—<i>Dramas, Poems</i>—Humorous. Soc of P. A. Heiberg. Very popular. One of the best writers. Sharp critic. Musical comedies and other romantic plays.</p> <p><b>Karl J. L. Almquist</b> (Swed.), (1793-1866).—<i>Novels, Essays, Poems</i>—Unique, imaginative, mystical. Fine characterization.</p> <p><b>H. N. Clausen</b> (Dan.), (1793-1877).—<i>Criticism</i>—A clear critic in the domain of theology.</p> <p><b>Foul Möller</b> (Dan.), (1794-1838).—<i>Novels, Poems, Student Songs</i>—Spiritually sound and original in thought and expression. Influence on later realism.</p> <p><b>M. C. Hansen</b> (Nor.), (1794-1842).—<i>Novels</i>—Romantic. His stories are bright, but not national.</p> <p><b>Christian Winther</b> (Dan.), (1796-1876).—<i>Tales, Poems</i>—A master of style. Thoroughly and naturally Danish. Emphasizes nature of Denmark.</p> <p><b>K. J. Böhström</b> (Swed.), (1797-1866).—<i>Philosophy</i>—Created an independent philosophical system.</p> <p><b>Henrik Hertz</b> (Dan.), (1797-1870).—<i>Dramas, Epics, Satires</i>—Founder of the new comedy in Denmark. Elegant and correct in style. Most original in his lyric poetry.</p>	<p><b>Alessandro Manzoni</b> (1785-1873).—<i>Novel, Dramas</i>—<i>The Betrothed</i>, the greatest Italian novel.</p> <p><b>Silvio Pellico</b> (1789-1854).—<i>Italian dramatist, poet, novelist</i>.</p> <p><b>Gino Capponi</b> (1792-1876).—<i>Italian historian</i>.</p> <p><b>Cecilia Bohl von Faber</b> (Fernan Caballero), (1797-1877).—<i>Spanish novels</i>.</p>	<p>1786. Swedish academy founded.</p> <p>1789. Beginning of French Revolution.</p> <p>1792. French republic declared.</p> <p>1796. Washington issues his "Farewell Address."</p>

ENGLISH	AMERICAN	FRENCH
<p><b>Robert Pollock</b> (1798-1827).—<i>Course of Time</i>.—A sound, serious, and heavy poet; suits Scotch theologians.</p> <p><b>Thomas Hood</b> (1798-1845).—<i>Poems</i>.—A humorous poet of the first rank; some pathetic verses of high quality.</p>	<p><b>Amos Bronson Alcott</b> (1796-1838).—<i>Concord Days, Table Talks, Sermons and Conversations</i>.—Suggestively idealistic, but lacking in general interest.</p>	<p><b>Auguste Comte</b> (1798-1857).—<i>Positive Philosophy</i>.—His course on positive philosophy is one of the important works of the nineteenth century.</p>
<p><b>Thomas B. Macaulay</b> (1800-1859).—<i>Essays, History of England, Lays of Ancient Rome</i>.—He makes history alive and readable. A partisan, but on the right side.</p>	<p><b>George Bancroft</b> (1800-1891).—<i>History of the United States</i>.—Faithfully prepared and honestly presented.</p>	<p><b>Jules Michelet</b> (1798-1874).—<i>History of France</i>.—Has given a new conception of history. According to him it is a resurrection of the life of the people studied in its material and in its spiritual aspect. His style is admirably adapted to his conception of history.</p>
<p><b>Harriet Martineau</b> (1802-1876).—<i>Political Economy</i>, etc.—A woman of remarkably strong intellect. Her positions well argued but perhaps too radical.</p>	<p><b>George Bushnell</b> (1802-1876).—<i>Nature and the Supernatural, Work and Play</i>.—Serious, didactic efforts with spiritual purpose.</p>	<p><b>Moréas de Balzac</b> (1799-1850).—<i>Novels</i>.—The author of the great prose of the Romantic school. His distinguishing features are an extreme delicacy and a subtle melancholy. His <i>Le Père Goriot</i>, in which history is often arranged to suit his views, is recommended on account of its style.</p>
<p><b>Sir Edward Bulwer Lytton</b> (1803-1873).—<i>Last Days of Pompeii, Last of the Barons</i>, etc.—A versatile and successful litterateur in several forms of the novel, but prominent in none.</p>	<p><b>Ralph Waldo Emerson</b> (1803-1882).—<i>Conduct of Life, Representative Men, Essays, Poems</i>.—The prophet of American culture. Coalesces oriental conceptions and occidental individualism.</p>	<p><b>Alfred de Vigny</b> (1797-1863).—<i>Chig Maré</i>, etc.—One of the great poets of the Romantic school. His distinguishing features are an extreme delicacy and a subtle melancholy. His <i>Chig Maré</i>, in which history is often arranged to suit his views, is recommended on account of its style.</p>
<p><b>Benjamin Disraeli</b> (1804-1881).—<i>Lothair, Times Gipsy</i>, etc.—Society novels eminently readable but thoroughly artificial.</p>	<p><b>George D. Prentiss</b> (1802-1870).—<i>Editor Louisville (Ky.) Journal</i>.—Witty, sarcastic, daring and effective.</p>	<p><b>Victor Hugo</b> (1802-1885).—<i>Novels, Lyrics</i>.—One of the world-poets. In the field of epic poetry he has no rival and as a lyricist but very few. His dramas are valued more as admirable lyric pieces than as plays.</p>
<p><b>James Martineau</b> (1805-1900).—<i>Philosophy</i>.—A philosophical thinker of insight and honesty.</p>	<p><b>John S. C. Abbott</b> (1805-1877).—<i>Biographies, Histories</i>, etc.—Ephemeral in interest or easily eclipsed.</p>	<p><b>Alexandre Dumas</b> (1803-1870).—<i>Novels, Dramas</i>.—The author of a large number of popular novels based upon history and remarkable for their easy style and the creative fertility with which they abound. His dramas have a place in the history of the French theater.</p>
<p><b>Elizabeth Barrett Browning</b> (1806-1861).—<i>Aurora Leigh, Poems</i>.—A pleasing lyrical gift and warm, human sympathy made her favorite poetess in the Victorian era.</p>	<p><b>Charles E. A. Gayarré</b> (1805-1895).—<i>History of Louisiana, Fernando de Lemos</i>, etc.—Entertaining and scholarly bilingual productions.</p>	<p><b>Prosper Mérimée</b> (1803-1870).—<i>Stories, Novels</i>.—His stories alone give him a place among the authors of the nineteenth century. They are little masterpieces.</p>
<p><b>John Stuart Mill</b> (1806-1873).—<i>Political Economy</i>.—Of thorough intellectual honesty and diamond-clear intellect he furthered the cause of political justice and personal freedom.</p>	<p><b>Nathaniel Hawthorne</b> (1804-1864).—<i>Twice Told Tales, Scarlet Letter, Marble Faun</i>, etc.—Marked by a subtle mastery and the touch of genius.</p>	<p><b>Prosper Mérimée</b> (1803-1870).—<i>Stories, Novels</i>.—His stories alone give him a place among the authors of the nineteenth century. They are little masterpieces.</p>
<p><b>Charles Darwin</b> (1809-1882).—<i>Origin of Species, Descent of Man</i>.—Laid and attractive in style and an unflinching lover of truth, he has had a greater influence on thought than any man of his time.</p>	<p><b>John S. C. Abbott</b> (1805-1877).—<i>Biographies, Histories</i>, etc.—Ephemeral in interest or easily eclipsed.</p>	<p><b>Prosper Mérimée</b> (1803-1870).—<i>Stories, Novels</i>.—His stories alone give him a place among the authors of the nineteenth century. They are little masterpieces.</p>
<p><b>Alfred Tennyson</b> (1809-1892).—<i>In Memoriam, Idylls of the King, Poems</i>.—The national poet of the late 19th century; a painstaking artist and master of verbal melody.</p>	<p><b>Charles E. A. Gayarré</b> (1805-1895).—<i>History of Louisiana, Fernando de Lemos</i>, etc.—Entertaining and scholarly bilingual productions.</p>	<p><b>Prosper Mérimée</b> (1803-1870).—<i>Stories, Novels</i>.—His stories alone give him a place among the authors of the nineteenth century. They are little masterpieces.</p>
<p><b>Elizabeth Gaskell</b> (1810-1865).—<i>Cranford, Mary Barton</i>, etc.—A writer of charming feminine humor. One of the first to make the economic problems the basis of a story.</p>	<p><b>Nathaniel P. Willis</b> (1806-1867).—<i>Poems, Sketches, Editorials</i>, etc.—Skillfully elaborated but diminishing in fame.</p>	<p><b>Prosper Mérimée</b> (1803-1870).—<i>Stories, Novels</i>.—His stories alone give him a place among the authors of the nineteenth century. They are little masterpieces.</p>
<p><b>William M. Thackeray</b> (1811-1863).—<i>Vanity Fair, The Newcomes, Henry Esmond</i>.—Satirist and humorist, but with great powers of characterization, especially of the everyday social elements.</p>	<p><b>William Gilmore Simms</b> (1806-1870).—<i>Poems, Novels, Biography</i>, etc.—Versatile, original and artistic.</p>	<p><b>Prosper Mérimée</b> (1803-1870).—<i>Stories, Novels</i>.—His stories alone give him a place among the authors of the nineteenth century. They are little masterpieces.</p>
<p><b>Charles Dickens</b> (1812-1870).—<i>Novels; David Copperfield, Oliver Twist</i>, etc.—A broad humorist than Thackeray, appealing to the common human sympathies and the ordinary sense of the ridiculous.</p>	<p><b>Henry W. Longfellow</b> (1807-1882).—<i>Outs Mr. Hyperion, Poems, Hiawatha</i>, etc.—Popular in appeal and simple in form.</p>	<p><b>Prosper Mérimée</b> (1803-1870).—<i>Stories, Novels</i>.—His stories alone give him a place among the authors of the nineteenth century. They are little masterpieces.</p>
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<p><b>Charles Dickens</b> (1812-1870).—<i>Novels; David Copperfield, Oliver Twist</i>, etc.—A broad humorist than Thackeray, appealing to the common human sympathies and the ordinary sense of the ridiculous.</p>	<p><b>Oliver Wendell Holmes</b> (1809-1894).—<i>Autocrat of the Breakfast Table, Novels, Poems</i>.—Clever, witty, versatile, and skillful.</p>	<p><b>Prosper Mérimée</b> (1803-1870).—<i>Stories, Novels</i>.—His stories alone give him a place among the authors of the nineteenth century. They are little masterpieces.</p>
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## CENTURY—Continued

GERMAN	SCANDINAVIAN	ITALIAN, SPANISH, RUSSIAN	HISTORICAL EVENTS
<p><b>Wilhelm Haring</b> (W. Alexis), (1796-1871).—<i>Patriotic Novels</i>—One of the first and the ablest of the German imitators of Walter Scott, wrote a series of patriotic novels treating of German history.</p> <p><b>Hoffmann von Fallersleben</b> (1796-1874).—<i>Poems</i>—Philologist and poet, best known for his lyrics in the style of the ballad.</p>		<p><b>Giacomo Leopardi</b> (It.), (1798-1837).—<i>Poems</i>—Famously with "the infinite vanity of all things."</p>	
<p><b>C. D. Grabbe</b> (1801-1836).—<i>Dramas</i>—Deeply pessimistic and romantically unbalanced, but often masterful in dramatic characterization.</p> <p><b>Wilhelm Hauff</b> (1802-1827).—<i>Lichtenstein, Man in the Moon, Short Stories</i>—An eminent novelist, greatly influenced by Walter Scott. <i>Lichtenstein</i> is a story of Württemberg in the sixteenth century.</p>	<p><b>Fredrika Bremer</b> (Swed.), (1801-1865).—<i>Novels</i>—Describes family life of middle class realism. Worked for emancipation of woman. Was popular in America and England.</p>	<p><b>Alexander Pushkin</b> (Russ.), (1799-1837).—<i>Poems, Stories, Novels, Dramas</i>—A great poet. Romantic at first. Later emphasized national feeling in Russian literature. Greatly influenced by Byron.</p>	<p>1799. Death of Washington.</p>
<p><b>Eduard Mörike</b> (1804-1875).—<i>Lyrics, Stories</i>—The greatest lyric poet of Russia. There is a peculiar charm in his delicacy of touch and his simplicity.</p>	<p><b>E. Keyser</b> (Nor.), (1803-1864).—<i>History</i>—Wrote a learned work on the Catholic church in Norway.</p>	<p><b>Manuel Bretón de los Herberos</b> (Sp.), (1800-1873).—<i>Dramas</i>—Popular modern Spanish poet. Gives a good picture of Spanish social life.</p>	<p>1801. Discovery of first asteroid by Piazzi.</p>
<p><b>Heinrich Laube</b> (1806-1884).—<i>Novels, Plays</i>—Witty, declamatory and sententious, but seldom a delicate poet. His chief works are novels or dramas of purpose in the spirit of radical young Germany.</p>	<p><b>Johan Ludvig Runeberg</b> (Swed.), (1804-1877).—<i>Poems, Dramas</i>—Born in Finland. Describes realistically Finnish home-life. Idyllic, epic, and lyric poetry. Fine characterization. Most popular are <i>Fänrik Ståls Söner</i>, dealing with Finnish-Russian war of 1808-1809.</p> <p><b>J. N. Madvig</b> (Dan.), (1804-1886).—<i>Latin Grammar</i>—Great linguist and Latin scholar.</p>	<p><b>Hans Christian Andersen</b> (Dan.), (1805-1875).—<i>Fairy Tales, Novels, Dramas, Poems</i>—Used language of the people and of childhood. Next to bible, his <i>Fairy Tales</i> have been translated into the most foreign languages.</p>	<p>1804. Napoleonic code adopted in France.</p>
<p><b>Fritz Reuter</b> (1810-1874).—<i>Poems, Novels</i>—A Mecklenburg poet who wrote in his own dialect. A born story-teller, with broad realistic humor.</p> <p><b>H. Ferdinand Freiligrath</b> (1810-1876).—<i>Poems, Translations</i>—Poet of the Revolution and friend of Longfellow. Some of his finest translations are from Robert Burns.</p>	<p><b>Jonas Hallgrímsson</b> (Ic.), (1807-1845).—<i>Iceland Gunnarsholms</i>—Popular patriotic songs. Excellent power over language. One of the best poets of modern Iceland.</p> <p><b>J. S. C. Weihe</b> (Nor.), (1807-1873).—<i>Poems</i>—Polymath sonnets, lyric and descriptive. Opposed bitterly the hyper-patriotism of Wergeland.</p> <p><b>H. A. Wergeland</b> (Nor.), (1808-1845).—<i>Poems</i>—Poet, patriot, and later of Denmark. Brilliant, original, and imaginative.</p> <p><b>Fred. Falckman-Müller</b> (Dan.), (1808-1876).—<i>Poems, Mythological Plays</i>—Subjects from Greek mythology, Bible and from life. <i>Adam Homo</i> is his greatest work. Satire of life. A monumental work.</p>	<p><b>Alcel Kolbow</b> (Russ.), (1809-1842).—<i>Lyrics</i>—Deep feeling. The Russian Burns.</p> <p><b>Nikolai Gogol</b> (Russ.), (1809-1852).—<i>Plays, Tales, Novels</i>—The greatest of Russian humorists. Satirizes all classes of society.</p>	<p>1805. Battle of Trafalgar.</p>
<p><b>Karl Gutzkow</b> (1811-1878).—<i>Novels, Plays</i>—For a time the most influential writer in Germany. Combated the misuse of political and clerical power. <i>Uriel Acosta</i>, his best drama, is a strong plea for freedom of thought.</p>	<p><b>F. A. Munck</b> (Nor.), (1810-1866).—<i>History</i>—His great history of Norway is in eight short volumes. Brilliant and industrious. Both Munck and Keyser were overpatriotic in believing Norway the hearth of Scandinavianism from the historic point of view.</p>	<p><b>W. G. Bellinsky</b> (Russ.), (1810-1848).—<i>Criticism</i>—In spite of the censorship of the press he carried a powerful uplifting influence on society by his literary criticism.</p>	<p>1807. Fulton's steamboat on the Hudson.</p>
<p><b>Berthold Auerbach</b> (1812-1882).—<i>Novels, Short Stories</i>—The poet of the Rumanian Black Forest. His stories of village life, though not realistic, charm by their naive elements.</p>	<p><b>A. Munck</b> (Nor.), (1811-1884).—<i>Lyric Poems</i>—His chief work is <i>Figen fra Norge</i>, taken from Norwegian history.</p> <p><b>August Blanche</b> (Swed.), (1811-1868).—<i>Comedy, Novels, Short Stories, Sketches</i>—Was very popular. Comedy deals with lower classes. Novels sensational. Stories and sketches realistic.</p>	<p><b>F. C. Asbjørnsen</b> (Nor.), (1812-1885).—<i>Folk Tales</i>—The Grimm of Norway.</p>	<p>1809. Battle of Wagram.</p>
<p><b>Friedrich Hebbel</b> (1813-1863).—<i>Dramas</i>—The chief German dramatist of the century. A great innovator. His best works represent the clash of new epochs with those passing away.</p>	<p><b>S. A. Kierkegaard</b> (Dan.), (1813-1855).—<i>Philosophy</i>—Denmark's greatest religious thinker. Strong imagination. Wrote a beautiful poetic prose.</p>	<p><b>Alexander Herzen</b> (Russ.), (1812-1870).—<i>Journalism</i>—Greatest journalist of his time. Devoted to pleas for liberal institutions.</p>	<p>1812. U.S. and English war.</p>



TABLE VII. NINETEENTH

ENGLISH	AMERICAN	FRENCH
<p><b>Charles Reade</b> (1814-1884).—<i>Peep Woffington, Cloister and Hearth</i>, etc.—A vigorous narrator, animated by hatred of injustice.</p> <p><b>Anthony Trollope</b> (1815-1882).—<i>Barsetshire Towers</i>, etc.—Admirably realistic presentation of English society, political and ecclesiastical.</p> <p><b>George Rawlinson</b> (1815-1902).—<i>Five Great Monarchies</i>.—A learned Assyrian and Oriental scholar.</p> <p><b>Charlotte Brontë</b> (1816-1855).—<i>Jane Eyre</i>, <i>The Professor</i>, etc.—Great power in novels based on narrow experience.</p> <p><b>James Anthony Froude</b> (1818-1894).—<i>History of England</i>.—A brilliant prose-writer makes history human and interesting and suggestive.</p> <p><b>George Eliot</b> (1819-1880).—<i>Silas Marner, Spanish Gypsy</i>, <i>Poems</i>.—The greatest woman novelist. A realist with insight. Powers of wit and characterization; construction not remarkable.</p> <p><b>Charles Kingsley</b> (1819-1875).—<i>Hypatia, Peverell</i>.—His novels, in spite of slight objections and a taint of sentimentality, are vigorous and wholesome.</p> <p><b>John Ruskin</b> (1819-1900).—<i>Stones of Venice, Modern Painters</i>, etc.—A great stylist. As art critic, subjective and governed by the moral suggestiveness of the object. As an economist, an idealist.</p> <p><b>John Tyndall</b> (1820-1893).—<i>Scientific Papers</i>.—Unsurpassed, unless it be Huxley's, as a popularizer of Darwin's ideas.</p> <p><b>Herbert Spencer</b> (1820-1903).—<i>First Principles</i>, etc.—A deep thinker but ponderous to style. Applied principle of evolution to sociology, history, etc.</p> <p><b>Matthew Arnold</b> (1822-1888).—<i>Essays and Criticism, Sohrab and Rustum, Poems</i>.—Liberal in thought, but dominated by aristocratic prejudice on the literary side. As a poet inclined to despairing pessimism; weak to the power of verbal melody.</p> <p><b>Edward A. Freeman</b> (1823-1892).—<i>Histories</i>.—A conscientious, honest, painstaking historian.</p> <p><b>Thomas Hughes</b> (1823-1896).—<i>Tom Brown at Oxford</i>, etc.—A manly, breezy person, who wrote one good book for boys.</p> <p><b>Thomas Henry Huxley</b> (1825-1895).—<i>Man's Place in Nature</i>, etc.—A master of exposition and, with Tyndall, very effective in presenting the idea of evolution.</p> <p><b>E. D. Blackmore</b> (1825-1900).—<i>Novels: Lorna Doone</i>, etc.—Infused an element of romance into the modern novel.</p> <p><b>Dinah Maria Mulock</b> (1826-1887).—<i>John Halifax</i>, etc., <i>Poems</i>.—Author of some twenty novels of which <i>John Halifax</i> is the best. Also of pleasing minor verse.</p> <p><b>Dante Gabriel Rossetti</b> (1828-1882).—<i>Poems: The Blessed Damozel</i>, etc.—A highly imaginative poet, a master of color in verse and on canvas.</p>	<p><b>John Lothrop Motley</b> (1814-1877).—<i>Dutch Republic, United Netherlands</i>.—A rapid, easy style in presenting results of research.</p> <p><b>Rufus W. Griswold</b> (1815-1857).—<i>Christian Ballads, Poets and Poetry of America, Famous Poets</i>.—Valuable critical studies marred by partiality.</p> <p><b>John G. Saxe</b> (1816-1887).—<i>The Money King, New Rules of the Lock</i>, etc.—Humorous and sprightly.</p> <p><b>Samuel A. Allibone</b> (1816-1889).—<i>Literature and Authors</i>.—Laborious and valuable.</p> <p><b>Henry D. Thoreau</b> (1817-1862).—<i>Walden, Excursions</i>.—Redolent of nature love, and cultured scholarship.</p> <p><b>John Bigelow</b> (1817).—<i>Life of Benjamin Franklin</i>.—Sympathetic and sage.</p> <p><b>J. G. Holland</b> (1819-1881).—<i>Timothy Titcomb's Letters, Kalvins</i>.—Enjoyed a large popularity.</p> <p><b>Edwin P. Whipple</b> (1819-1886).—<i>Essays and Reviews, America Litterata</i>.—Of very distinct cultural value.</p> <p><b>James Russell Lowell</b> (1819-1891).—<i>Among My Books, My Study Windows, Blueless Papers, Poems: Sir Launfal</i>, etc.—Keen, sparkling, scholarly, and artistic.</p> <p><b>Walt Whitman</b> (1819-1892).—<i>Poems: Leaves of Grass, My Captain</i>, etc.—Unique in claim and form.</p> <p><b>Julia Ward Howe</b> (1819-1910).—<i>Social and Philosophical Papers, Battle Hymn of the Republic</i>.—Representative of the spirit of the times.</p> <p><b>Margaret J. Preston</b> (1820-1897).—<i>Bechenbrook, Curious, Colonial Ballads</i>.—Cultured and of human interest.</p> <p><b>Richard Grant White</b> (1821-1885).—<i>Words and Their Uses, Everyday English</i>.—Scholarly and suggestive.</p> <p><b>Thomas Buchanan Read</b> (1822-1872).—<i>Poems, Drifting, Sheridan's Ride</i>, etc.—Commendable, especially in form.</p> <p><b>James Parton</b> (1822-1891).—<i>Biographies</i>.—Serviceable, but not satisfying.</p> <p><b>Edward Everett Hale</b> (1822-1909).—<i>The Man Without a Country, His Last Best</i>.—Vigorous and pointed, but provincial.</p> <p><b>Donald G. Mitchell</b> (1822-1909).—<i>Dream Life, Reveries of a Bachelor</i>.—Attractive in meditation and grace.</p> <p><b>George H. Boker</b> (1823-1890).—<i>Plays, Poems of the War</i>.—Indisputably appreciated.</p> <p><b>Francis Parkman</b> (1823-1893).—<i>Oregon Trail, Medicine and Wolfe</i>, etc.—Romantic, picturesque and of real interest.</p> <p><b>George W. Curtis</b> (1824-1892).—<i>Patriarch Papers, First and Last</i>, etc.—Widely popular and effective.</p> <p><b>Bayard Taylor</b> (1825-1878).—<i>Northern Travel, Greece and Russia, Poems of the Orient, Translation of Faust</i>.—Too good at many things to be best at any.</p> <p><b>Stephen Collins Foster</b> (1826-1864).—<i>Old Folks at Home, Old Uncle Ned</i>, etc.—Popular in vein and melody.</p> <p><b>Low Wallace</b> (1827-1905).—<i>The Fair God, Prince of India, Ben Hur</i>.—Uneven, but at times highly successful.</p>	<p><b>Eugene Labiche</b> (1815-1888).—<i>Comedies</i>.—A master in the art of writing many light comedies or vaudevilles.</p> <p><b>Lecote de Lisle</b> (1818-1894).—<i>Poems</i>.—One of the greatest poets of the second half of the nineteenth century. He was the head of the group of poets called the Parnassians who sought above all technical perfection in poetry. He is a pessimist and in all his poems we see no aspiration toward death as the final rest.</p> <p><b>Emile Augier</b> (1820-1889).—<i>Dramas</i>.—One of the masters of the modern French drama. Less aggressive than his contemporary Dumas the Son, his influence in some respects was greater.</p> <p><b>Gustav Flaubert</b> (1821-1880).—<i>Novels</i>.—Wrote the most perfect novel of the century, <i>Madame Bovary</i>. One of the other side his <i>Salammbo</i> is purely romantic.</p> <p><b>Octave Feuillet</b> (1821-1890).—<i>Novels, Dramas</i>.—All his novels describe society.</p> <p><b>Henri Murger</b> (1822-1861).—<i>Novels</i>.—His <i>Scenes of Bohemian Life</i>, in which he depicts the bohemian life of a certain class of students, is still enjoyed.</p> <p><b>Edmond de Goncourt</b> (1822-1890).—<i>Novels</i>.—He and his brother Jules de Goncourt claim to be the first to paint true life. They are the apostles of "modernism."</p> <p><b>Emile Zola</b> (1822-1899).—<i>Novels</i>.—With Alexandre Chatriau he wrote a large number of novels in which are painted in a free and simple style the customs and thoughts of the Alsatians especially during the war of the first empire.</p> <p><b>J. Ernest Renan</b> (1823-1892).—<i>Life of Jesus</i>, etc.—Critic and historian but above all a marvelous artist, he greatly influenced the thought of his day. With Taine, but in a different way, he contributed to the triumph of positivism.</p> <p><b>Alexandre Dumas the Son</b> (1824-1895).—<i>Novels, Dramas</i>.—Marvellously clear and concise style. Dramas full of wit but lack in kindliness.</p> <p><b>Alexandre Chatriau</b> (1826-1890).—<i>Novels</i>.—See Erkman (1822-1896).</p> <p><b>Francisque Sarcey</b> (1827-1899).—<i>Criticism</i>.—A recognized authority on the drama, his criticism bears especially on the theater.</p> <p><b>H. A. Taine</b> (1828-1893).—<i>History of Literature</i>, etc.—<i>Origins of Contemporary France</i>, his most powerful work, shows his genius as a critic and as historian. He belongs to the same school as Litton but he is more aggressive.</p>

## CENTURY—Continued

GERMAN	SCANDINAVIAN	RUSSIAN, SPANISH, HUNGARIAN	HISTORICAL EVENTS
<p><b>Otto Ludwig</b> (1813-1865).—<i>Dramas, Shakespeare Studies, Novels</i>—Master of detail-painting in his novels. His novel <i>Between Heaven and Earth</i> has become a classic. His dramatic work suffered under critical sentences.</p> <p><b>Richard Wagner</b> (1813-1883).—<i>Operas</i>—Creator of the music-drama. Insisted that German drama must be national and so drew for themes on older Germanic myths.</p> <p><b>Emanuel Geibel</b> (1815-1884).—<i>Poems, Voices of the Time</i>—Successful writer of popular songs. <i>Voices of the Time</i> treats political events in a conciliatory tone.</p> <p><b>Gustav Freytag</b> (1816-1895).—<i>Novels, Dramas</i>—His <i>Antennae</i> is a cycle of the greatest modern German novels, awaking the national consciousness of the German people.</p> <p><b>Theodor Storm</b> (1817-1888).—<i>Lyrics, Novels</i>—Masterful writer of the novel of reminiscence. The lyric note is prominent in his prose.</p> <p><b>Gottfried Keller</b> (1819-1890).—<i>Novels, Short Stories</i>—Master of the "novelle," or short story. Strong independence of spirit reflected in this Swiss poet.</p> <p><b>Salomon Mosenthal</b> (1821-1877).—<i>Novels</i>—Chiefly historical, including <i>Leah the Forsaken, The Queen of Sheba</i>, etc.</p> <p><b>Conrad Ferdinand Meyer</b> (1825-1898).—<i>Short Stories, Novels</i>—Countryman of Keller, and one of the best story writers of the century. Particularly happy in giving true historical coloring to his novels.</p> <p><b>J. V. von Scheffel</b> (1826-1886).—A late successor of Walter Scott. <i>Eckehard</i>, one of the greatest German historical novels. <i>The Trumpeter of Sickingen</i>, an epic in the Romantic spirit.</p>	<p><b>J. Moe</b> (Nor.), (1813-1880).—<i>Poems</i>—Lyrics. Assisted <i>Ashbjørnsen</i> in collecting the popular tales of Norway.</p> <p><b>J. C. Heistrup</b> (Dan.), (1818-1892).—<i>Comedies, Popular Songs</i>—A great favorite. Adapts language to characters. Vivid picture of student life and life of middle classes.</p> <p><b>Meir Goldschmidt</b> (Dan.), (1819-1887).—<i>Journalism, Novels, Short Stories</i>—Good stylist. Felt keenly his Jewish origin, but was not ashamed of it.</p> <p><b>Victor Rydberg</b> (Swed.), (1828-1895).—<i>Philosophy, History, Mythology, Novels, Poems</i>—Great scholar, poet, and philosopher. Extreme purist in language.</p>	<p><b>Iwan Gontcharoff</b> (Russ.), (1813-1891).—<i>Novels</i>—At first romantic then realistic. His great work <i>Obdorsk</i> represents strongly that inertia which renders the hero incapable of action.</p> <p><b>Michail Lermontov</b> (Russ.), (1814-1841).—<i>Poems, Novels</i>—Powerful prose. Strongly attacked the government and the prevailing tone in society.</p> <p><b>José de Espronceda</b> (Sp.), (1815-1842).—<i>Lyric Poems</i>—Imbued with the manner and spirit of Byron.</p> <p><b>Alexis Tolstol</b> (Russ.), (1817-1875).—<i>Dramas</i>—Excellent historical dramatist. Fine artistic sense.</p> <p><b>Iwan Turgenev</b> (Russ.), (1818-1883).—<i>Novels, Stories</i>—Great prose-artist. Melancholy pessimism. Faithful reflection of the inner development of Russian society.</p> <p><b>Feodor Dostoyevsky</b> (Russ.), (1821-1881).—<i>Novels</i>—Great power of psychological analysis. Even claimed by Russian criminologists as their colleague.</p> <p><b>Nikolai Nekrasoff</b> (Russ.), (1821-1888).—<i>Lyrics</i>—Depth of feeling. Rare impassioned lyric power.</p> <p><b>Alex. Petöfi</b> (Hung.), (1823-1849).—<i>Lyrics, Translations</i>—One of the greatest lyric poets of the nineteenth century. Truth and naturalness. Full of the passion, melancholy, and humor of the Hungarians.</p> <p><b>Michail Saltikow</b> (Russ.), (1826-1889).—<i>Satiric Tales</i>—Written with his heart's blood. Keen wit, original in invention.</p> <p><b>Juan Valera</b> (Sp.), (1827).—<i>Novels</i>—Combines elegance of language with depth of thought.</p>	<p>1814. Stephenson's locomotive.</p> <p>1815. Battle of New Orleans.</p> <p>1815. Napoleon defeated at Waterloo.</p> <p>1821. Greek war of independence against Turkey.</p> <p>1824. National gallery in London opened.</p>

ENGLISH	AMERICAN	FRENCH
<p><b>George Meredith</b> (1828-1909).—<i>The Egoist, Diana of the Crossways</i>, etc.—Novels of extraordinary power. Style epigrammatic and not attractive.</p> <p><b>Samuel R. Gardiner</b> (1829-1902).—<i>Historical</i>.—A happy combination of attractive narrative and scholarly thoroughness.</p>	<p><b>Henry Timrod</b> (1829-1867).—<i>Poems</i>.—Admired in his time for his taste and manner.</p> <p><b>Chas. Dudley Warner</b> (1829-1909).—<i>My Summer in a Garden, Little Journeys</i>, etc.—Catholic in interests and attainments.</p> <p><b>John Eaton Cooke</b> (1830-1886).—<i>Novels: Story of Eagle's Nest, etc., Lives of Lee and Jackson</i>.—Firm favorites with romantic youth.</p>	<p><b>Jules Verne</b> (1828-1905).—<i>Twenty Thousand Leagues Under the Sea, Around the World in Eighty Days</i>, etc.—His novels have done much to popularize several branches of science. Interesting and instructive, they have been widely read all over the civilized world by both young and old.</p>
<p><b>Jean Ingelow</b> (1820-1897).—<i>Poems</i>.—A charming lyrical talent, of limited productive power.</p> <p><b>Justin McCarthy</b> (1830).—<i>History of Our Own Times, Novels</i>.—A prolific journalist, novelist, and historian of modern times.</p>	<p><b>Paul Hamilton Hayne</b> (1831-1886).—<i>Sonnets, Legends, Lyrics</i>.—In sonnets excellent, in other poems too prolific.</p>	<p><b>Jules de Goncourt</b> (1830-1870).—<i>Novels</i>.—See Edmond de Goncourt (1822-1890).</p>
<p><b>Edward Lord Lytton, (Owen Meredith),</b> (1811-1891).—<i>Biography of Palmer Lytton, Lucile</i>, etc.—Fluent writer of light verse and society verse.</p>	<p><b>Louise May Alcott</b> (1832-1888).—<i>Little Women, Little Men</i>.—Influential in their popular appeal.</p> <p><b>Edmund C. Stedman</b> (1838-1908).—<i>Victorian Poets, Poets of America, Alice of Monmouth, Poise in Wall Street</i>.—Showing creative power and critical ability.</p>	<p><b>Victorien Sardou</b> (1831-1908).—<i>Dramas</i>.—Although the theater of Sardou is generally superficial this author has a remarkable talent for showing exterior life and many of his vaudevilles, comedies and historical dramas met with pronounced success.</p>
<p><b>Edwin Arnold</b> (1832-1904).—<i>Light of Asia, Poems</i>.—An able journalist and prolific minor poet.</p>	<p><b>Chas. Farrar Browne (Artemus Ward)</b> (1834-1867).—<i>Artemus Ward, His Book</i>, etc.—Humorous in exaggeration and a perversion.</p> <p><b>Frank R. Stockton</b> (1834-1902).—<i>Rudder Grange, The Lady of the Tiger</i>.—Ingenuous in plot, straightforward in style.</p>	<p><b>Henri Meilhac</b> (1832-1897).—<i>Ludovic Halévy</i> (1834-1908).—<i>Comedies</i>.—Wrote together a number of very successful light comedies. They created the "opérette."</p>
<p><b>William Morris</b> (1834-1896).—<i>Essays on Art, etc., Poems, Early Paradise</i>.—Prolific as a narrative poet, fond of classic and medieval legends.</p> <p><b>George du Maurier</b> (1834-1896).—<i>Peter Ibbotson, Trilby</i>.—An artist and poet. <i>Peter Ibbotson</i> is a fanciful romance of dream life. <i>Trilby</i>, scene in Latin quarter of Paris, a masterful study of character.</p>	<p><b>Moses Cati Tyler</b> (1835-1900).—<i>History of American Literature</i>.—Accurate and exhaustive.</p> <p><b>Samuel L. Clemens</b> (1835-1910).—<i>Innocents Abroad, Huckleberry Finn</i>, etc.—Thoroughly representative of American humor.</p> <p><b>Thomas Bailey Aldrich</b> (1836-1907).—<i>Novels: Moravia, Dean</i>, etc.—Cultivated and of literary talent.</p>	<p><b>Edouard Paileron</b> (1834-1899).—<i>Comedies</i>.—His light comedies are full of graceful and delicate touches. In <i>the Monde</i> as <i>l'on s'ennoie</i> his tone is considerably raised.</p>
<p><b>John Richard Green</b> (1837-1883).—<i>History of the English People</i>.—Industrious and conscientious. His work more than a record of war and politics. Clear and simple style.</p>	<p><b>William Dean Howells</b> (1837).—<i>Venetian Life, Mrs. Silas Lapham</i>, etc.—Realistic and entertainingly descriptive.</p> <p><b>John Burroughs</b> (1837).—<i>Walden, Robin, Winter Satisfactions</i>.—Strongly uttering the charms of nature.</p>	<p><b>Henri Beque</b> (1837-1899).—<i>Dramas</i>.—With the "Corbreaux" (Cruve) a new school of drama was inaugurated: The naturalists play. In spite of his exaggerations dramatic art owes a great deal to Beque.</p>
<p><b>Algernon Chas. Swinburne</b> (1837-1909).—<i>Poems</i>.—A poet of remarkable musical power, master of handling but involved prose, a cult of enthusiasm and eloquence.</p> <p><b>John Morley</b> (1838).—<i>Criticism, English Men of Letters</i>, (Ed.).—A sound literary historian and critic and a thinker of force and scope.</p>	<p><b>Thomas E. Lounsbury</b> (1838).—<i>Life of Cooper, Studies in Chaucer</i>, etc.—Of recognized scholarship and ability.</p> <p><b>Francis Bret Hart</b> (1839-1902).—<i>Luck of Roaring Camp, Gabriel Conroy, Poems</i>.—Of international fame. Faithful and skillful character portrayals.</p>	<p><b>Sully-Prudhomme</b> (1839-1907).—<i>Poems</i>.—One of the greatest poets of the nineteenth century. From the "Paranassus" he took their respect for form. He was not only an artist but a thinker and a moralist. In him positivism and idealism are perfectly blended.</p>
<p><b>Walter H. Pater</b> (1839-1894).—<i>Marius the Epicurean</i>, etc.—A wonderfully finished prose style, which sometimes diverts attention from the justness and beauty of the thought.</p>	<p><b>Joaquin Miller</b> (1841).—<i>The Danites in the Sierras, Slinger of the Sierras</i>.—With the sweep and breadth of the prairies.</p>	<p><b>Garçon Paris</b> (1841-1903).—<i>Philosophy</i>.—Greatest literary critic of France since Sainte-Beuve, especially on early French literature.</p>
<p><b>Henry Austin Dobson</b> (1840).—<i>Vignettes in Rhyme, Proverbs in Prose</i>.—The English Iluzac. An authority on eighteenth century social and literary life. Charming light verses.</p> <p><b>Thomas Hardy</b> (1840).—<i>Novels: Tess of d'Uverville</i>, etc.—Novels depicting country life. A writer of broad humanity. His books pose as at once wit, realism, and an idyllic quality.</p>	<p><b>Sidney Lanier</b> (1842-1881).—<i>The Bug's Prosser, Tiger-Lilies, Poems</i>.—Artistic to a high degree.</p> <p><b>George W. Cable</b> (1844).—<i>Old Creole Days</i>, etc.—Successful in achievement of purpose.</p>	<p><b>Alphonse Daudet</b> (1840-1897).—<i>Novels</i>.—In most of his works Daudet is a painter of rare ability of manners and customs; in two or three he shows a very keen psychological insight. He is one of the great prose writers of the century.</p>
<p><b>William Black</b> (1841-1898).—<i>Novels: In Silk Attire</i>, etc.—His stories have considerable charm but not much force. Gaelic bloodland depicted pleasantly but unconvincingly.</p> <p><b>Robert W. Buchanan</b> (1841-1901).—<i>Alons in London, Poems</i>.—A minor poet and dramatist of considerable output. Known for his attack on Rossetti in <i>The Fleishy School of Poetry</i>.</p>	<p><b>Elizabeth N. Phelps Ward</b> (1844-1911).—<i>Gate-Ajar</i>, etc. Widely read for religious sentiment.</p>	<p><b>Emile Zola</b> (1840-1902).—<i>Novels</i>.—Called the head of the naturalistic school because he defined the theories of the school. His twenty volumes of the Rougon-Macquart series are a grand epopee of "human animality." In his later works materialism becomes idealism and his intense pessimism an exaggerated optimism. He is in literature a great painter of masses and crowds.</p>
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## CENTURY—Continued

GERMAN	SCANDINAVIAN	ITALIAN, SPANISH, RUSSIAN	HISTORICAL EVENTS
<p><b>Friedrich Schlegel</b> (1829).—<i>Novels</i>—The novelist of German social conditions. <i>Problematic Characters</i> and <i>In Bond and Free</i> are two novels attempting to reconcile the clash of the classes.</p> <p><b>Paul Heyse</b> (1830).—<i>Novels, Short Stories, Poems</i>—Long the central figure of the Munich school of poets.</p> <p><b>Marie von Ebner-Eschenbach</b> (1830).—<i>Fables, Novels</i>—The most venerable among the women writers of Germany.</p> <p><b>Felix Dahn</b> (1834).—<i>History, Novels</i>—Noted historian and historical novelist, famous as author of <i>A Struggle for Rome</i>, dealing with the conflict between the Goths and Romans.</p> <p><b>Georg Ebers</b> (1837-1895).—<i>Egyptology, Novels</i>—An Egyptologist. Wrote novels dealing with Egyptian life.</p> <p><b>Ludwig Ansergruber</b> (1839-1889).—<i>Dramas, Prose Tales, Poems</i>—Highly endowed Austrian dramatist. A pioneer of realism.</p> <p><b>Karl Robert Eduard Hartmann</b> (1842-1906).—<i>Philosophy, criticism</i>.</p> <p><b>Friedrich Nietzsche</b> (1844-1900).—<i>Philosophy, Criticisms</i>—Prophet of individualism. His greatest work, <i>Thus Spoke Zarathustra</i>, left an indelible impression on the literature of his time.</p> <p><b>Detlev von Liliencron</b> (1844-1910).—<i>Epics, Poems</i>—The chief lyric poet of the epoch.</p>	<p><b>Henrik Ibsen</b> (Nor.), (1828-1906).—<i>Dramas, Poems</i>—Most masterful dramatic genius of the nineteenth century. Sharp as fire, terse and vivid dialogue. Attacked conventional hypocrisy.</p> <p><b>B. Björnson</b> (Nor.), (1832-1910).—<i>Novels, Dramas, Poems</i>—Very popular. Forceful, deeply in earnest. Author of Norway's favorite national song. Active in public questions.</p> <p><b>Jonas Lie</b> (Nor.), (1833-1908).—<i>Stories, Dramas</i>—Sketches of nature and popular life in the north of Norway.</p> <p><b>Mathias Jorchumsson</b> (Ic.), (1835).—<i>Poems, Dramas</i>—Lyric and tragic. Translator of Shakespeare, Byron.</p> <p><b>Karl Sjöström</b> (Swed.), (1841-1903).—<i>Poems</i>—Clear elegant form.</p> <p><b>Georg Brandes</b> (Dan.), (1842).—<i>Literary Essays</i>—A piercing literary critic. Splendid use of language. Has had a hard career.</p>	<p><b>Leo Tolstoy</b> (Russ.), (1828-1910).—<i>Novels, Essays, Criticisms</i>—Strong individualism paired with the doctrine of non-resistance. Powerful appeal to simple life of the people as a standard of civilization.</p> <p><b>of Echegaray</b> (Sp.), (1835).—<i>Dramas</i>—Most prominent representative of the modern Spanish dramatists. Romantic in tone.</p> <p><b>Giosuè Carducci</b> (It.), (1836-1907).—<i>Poems</i>—Progressive, liberty-loving lyrics.</p> <p><b>Giovanni Verga</b> (It.), (1840).—<i>Novels</i>—Tales of Sicilian peasantry.</p>	<p>1831. Death of Mrs. Siddons.</p> <p>1832. Cholera in Europe and America.</p> <p>1835. Morse's model electrical telegraph.</p> <p>1839. Daguerre's perfected photographic process.</p> <p>1844. Electrical telegraph between Baltimore and Washington.</p>

TABLE VII. NINETEENTH CENTURY—Continued

ENGLISH	AMERICAN	FRENCH	GERMAN	SCANDINAVIAN	RUSSIAN, POLISH, HUNGARIAN, ITALIAN, SPANISH, PORTUGUESE	HISTORICAL EVENTS
			<b>Ernst von Wildenbruch</b> (1845-1909).— <i>Dramas, Short Stories, Poems</i> .—The greatest historical dramatist of his time.		<b>B. Pérez Galdós</b> (Sp.). (1843).— <i>Novels, Dramas</i> .—Studies of Spanish political and religious life.	
	<b>Arthur R. Hardy</b> (1847).— <i>Pastor Ross</i> , etc.—Of trained literary ability.	<b>Emile Faguet</b> (1847).— <i>Criticism</i> .—One of the great critics of our days.		<b>Hoiger Drachmann</b> (Dan.). (1846-1908).— <i>Novels, Lyrics, Dramas</i> .—His lyric poems and lyric dramas rank among the best.	<b>Henryk Sienkiewicz</b> (Polish). (1846).— <i>Novels</i> .—Very attractive historical novels. Keen at exploiting remarkable epochs of history.	1846. Mexican war.
	<b>James Lane Allen</b> (1849).— <i>Poets and Poets, The Choir Invisible</i> , etc.—Reaching a high standard of excellence.	<b>Frédéric Masson</b> (1847).— <i>Histories</i> .—His best known histories are on the private life of Napoleon.		<b>August Strindberg</b> (Swed.). (1849).— <i>Novels, Dramas, Short Stories, Lyrics</i> .—Greatest writer of to-day in Sweden. Superb dramatist.		
<b>Robert Louis Stevenson</b> (1850-1894).— <i>Essays, Novels, Child's Garden of Verses</i> , etc.—Careful and finished as a stylist, an excellent storyteller. <i>Treasure Island</i> and his <i>Scottish Tales</i> are true classics.		<b>Ferdinand Brunetiere</b> (1849-1906).— <i>Criticism</i> .—Occupies a high rank among the modern critics.				
	<b>Robert Louis Stevenson</b> (1850-1894).— <i>Essays, Novels, Child's Garden of Verses</i> , etc.—Careful and finished as a stylist, an excellent storyteller. <i>Treasure Island</i> and his <i>Scottish Tales</i> are true classics.	<b>Jean Richepin</b> (1849).— <i>Dramas</i> .—A poet of great talent and power. His drama <i>The Tramp</i> is one of the good plays of our times.				
		<b>Pierre Loti</b> (1850).— <i>Novels, Travels</i> .—Painter and a poet who gives us an image of his impressions of life and of the countries through which he passes.				1850. Clayton-Bulwer treaty.
		<b>Paul Bourget</b> (1852).— <i>Novels</i> .—He is a scientific psychologist who has used his great power of analysis in the study of society people.				
		<b>Jules Lemaitre</b> (1853).— <i>Dramas, Criticism</i> .—The impressionist critic par excellence.				
		<b>Edmond Rod</b> (1857-1910).— <i>Novels</i> .—The problem of human destiny.	<b>Hermann Sudermann</b> (1857).— <i>Plays, Novels</i> .—Foot of the realistic school. His great novel is <i>Das Geschick</i> , reflecting the struggles of the author's own life.	<b>Henrik Pontoppidan</b> (Dan.). (1857).— <i>Novels</i> .—Greatest prose writer of to-day. Ironical.	<b>Wesewolod Garshin</b> (Russ.). (1855-1888).— <i>Novels</i> .—Glorious fantasy. Unfortunately marred by detailed psychological analysis.	1853. Louis Napoleon installed. 1854. Treaty between United States and Japan. 1858. First Atlantic cable.
		<b>Paul Hervieu</b> (1857).— <i>Dramas</i> .—Power and love, but very little human indulgence.		<b>Selma Lagerlöf</b> (Swed.). (1858).— <i>Novels, Short Stories</i> .—World-wide renown. Original, romantic, imaginative, charming.		1859. Darwin's Origin of Species.
		<b>Eugene Brieux</b> (1858).— <i>Dramas</i> .—A vigorous playwright who faithfully depicts and attacks some of the bad sides of our modern civilization.		<b>Verner von Heidenstam</b> (Swed.). (1859).— <i>Novels, Short Stories, Poems</i> .—Chiefly historical prose.		
				<b>Gustaf Fröding</b> (Swed.). (1860).— <i>Lyrics</i> .—Harmonic mixture of elegant language of poetry with natural language of everyday life.		1861-5. Civil war in United States.
		<b>Edmé Doumic</b> (1860).— <i>Criticism</i> .—History of French literature and several volumes of literary criticism.		<b>Oskar Lererich</b> (Swed.). (1860-1906).— <i>Short Stories, Sketches, Literary Essays, Poems</i> .—Artistic and elegant use of the language. Perhaps Sweden's greatest literary critic.	<b>G. d'Annunzio</b> (It.). (1863).— <i>Novels, Poems, Tragedies</i> .—Realistic novels; powerful poetic tragedies.	
		<b>Marcel Prévost</b> (1862).— <i>Novels</i> .—One of the most successful of the younger generation of novelists.	<b>Gerhard Hauptmann</b> (1862).— <i>Dramas</i> .—Chief German dramatist of our day. His symbolist drama, <i>The Sunken Bell</i> is one of the most popular works of our time.			
		<b>Maurice Barrès</b> (1862).— <i>Novels</i> .—Penetrating psychology in his novels.		<b>Per Hallström</b> (Swed.). (1865).— <i>Novels, Short Stories, Lyrics, Dramas</i> .—Imaginative. Good in psychological analysis.		1867. Alaska purchased by the United States.
<b>Israel Zangwill</b> (1864).— <i>Novels, Dramas, Essays</i> .—As Jew, an exponent of the Zionist movement. Successful in the essay and especially in the novels depicting Jewish scenes and characters.		<b>Henri de Régnier</b> (1864).— <i>Novels, Poems</i> .—A symbolist poet of shadows and dreams.				1870. Franco-Prussian war.
<b>Rudyard Kipling</b> (1865).— <i>Novels, Stories, Poems</i> .—A vigorous, audacious, efficient writer. The most original genius among English literary men of to-day.						1871. Republic proclaimed in Spain.
<b>Stephen Phillips</b> (1865).— <i>Essays, Poems, Poets and Poets</i> .—Lyric tragedies in blank verse, akin in spirit to the French classic drama.		<b>Edmond Rostand</b> (1868).— <i>Dramas</i> .—With his <i>Cyrano de Bergerac</i> runs the prediction of a revival of the Romantic drama.			<b>Maxim Gorki</b> (Russ.). (1868).— <i>Tales, Novels</i> .—Masterful presentation of the life of those cast out by society.	1876. Centennial exposition at Philadelphia.
		<b>Henri Bernheim</b> (1874).— <i>Dramas</i> .—A dramatic artist of powerful works.				











king of Denmark, after the death of her former husband. Claudius prepared poisoned wine, which he intended for Hamlet; but the queen, not knowing it, drank it, was poisoned and died. Hamlet, seeing his mother fall dead, rushed on the king and killed him almost by accident, and is killed himself, but is reinstated again in the hands of Justice.

well by a pomohed rapier in the hands of Lartea.  
**Hard Times.**—A novel by Dickens. Bounderby,  
 a cruel and avaricious man, is the banker of the  
 place. When past fifty years of age he married  
 Louisa, daughter of Thomas Gradgrind. The  
 bank was robbed, and Bounderby believed Stephen  
 Blackpool to be the thief, because he had dismissed  
 him from his employ. The culprit was Tom  
 Gradgrind, the banker's brother-in-law, who escaped  
 out of the country. In the dramatised version,  
 the bank was not robbed, and the money was  
 sent to another drawer for safety.

**Heart of Midlothian, The.**—A novel by Sir Walter Scott, published in 1818. It has for heroine Jeanie and Effie Deans. Among the other characters are Dumbiedykes and Madge Wildfire. It has often been dramatised. "The Heart of Midlothian" was the popular name for the tollbooth at Edinburgh, the capital of the county of Midlothian.

**Hiawatha, The Song of.**—A poem by Henry Wadsworth Longfellow, written in the following peculiar measure:

Should you ask me, "Whence three stories?"

I should answer, I should tell you.

"I repeat them as I heard them."

The poem is entirely devoted to a description of life among the aboriginal tribes of America. It was published in 1855. Hiawatha is a mythical person believed by some of the North American Indians to have been sent among them to clear their rivers, forests, and fishing-grounds, and to teach them the arts of peace. When the white man came they were at war, but at the time of his departure was at hand when the trust was

To the kingdom of Ponemah.

**Highland Mary.**—A song by Robert Burns, which Burns himself thought was in his happiest manner, and which refers, he says, to one of the most interesting passages of his youthful days. By this he means his attachment to Mary, a servant in the family of Mr. Hamilton, who would be remembered," says Burns, "with Dandie, Bessie, and Petrarck's Laura." It was arranged that the lovers should become man and wife, and that Mary should go to her friends to prepare for the wedding. But before her departure came the farewell scene so touchingly described in the poem:

Our parting was fu' tender;  
And, pledging aft to meet agai

We tore ourselves asunder:  
But oh! full death's not mine; I live.

That nipt my flower see earl

That wraps my Highland Ma

**Hohenlinden.**—A poem by Thomas Campbell, published in 1802, celebrating the battle of Hohenlinden, gained by Moreau and the French over the Austrians. The poet visited the battlefield on December 2, 1800.

December 3, 1800.  
**Home, Sweet Home.**—A popular lyric contained in the drama of *Clari, the Maid of Milan*, by John Howard Payne. The beautiful melody to which it has been wedded is said to be of Italian or Sicilian origin, though by some it is attributed to Sir Henry Rowley Bishop. Perhaps the latter merely arranged and harmonized it.

[illegible]

**Hypatia.**—A novel by the Rev. Charles Kingsley, the scene of which is laid in Alexandria, at a time when Christianity was gaining ground against Paganism and the neo-Platonism of the schools. Hypatia herself was born about the year 370, and, after attracting to her lectures on philosophy a large and brilliant auditory, was torn to pieces by the rabble of her native city in 415. *Hypatia* appeared in 1853.

**Hyperion.**—A romance in four books, by Henry Wadsworth Longfellow. This work, which was the result of an extensive tour in Germany, was published in 1839, and, with much that is purely fanciful and imaginative, contains much that came within the actual experience of the author.

who is represented, idealized, in the character of Paul Flemming. The episode with Mary Ashburton is supposed to have reference to a real occurrence. The book is full of description and of eloquent discussion, besides being interspersed with sketches of legend and of song.

**Idylls of the King.**—A series of poems by Tennyson. Taken together they form a parable of the life of man. Each idyll taken as a separate picture represents the war between sense and soul. In *Lancelot and Guinevere* the lower nature leads them astray and there is intense struggle before the higher nature prevails. In *Vivien, Tristan, and Modred* the base and sensual triumph. In *Arthur, Sir Galahad and Percivale*, it is the victory of the spiritual.

**Head.**—A famous Greek epic poem by Homer. It is the tale of the siege of Troy, in twenty-four books. It is written in Greek hexameters, and commemorates the deeds of Achilles and other Greek heroes at the siege of Troy. Books one, two, and three are introductory to the war. Paris proposes to decide the contest by single combat, and Menelaus accepts the challenge. Paris, giving orders to his army, carried off by Venus, and Agamemnon demands the return of Helen. Achilles gives up Troy in fulfillment of the compact, and the siege follows. The gods take part, and frightful slaughter ensues. At length Achilles slays

Hector, and the battle is at an end. Old Priam, going to the tent of Achilles, craves the body of his son Hector; Achilles gives it up, and the poem concludes with the funeral rites of the Trojan hero. Vergil continues the tale from this point, shows how the city was taken and burnt, and then continues with the adventures of Aeneas, who escapes from the burning city, and makes his way to Italy.

**Ingotideby Legends.** The collection of legends in prose and verse, supposed to have been found in the family chest of the Ingotideby family, and related by Thomas Ingotideby. Of the poetical pieces it is not too much to say that, for originality of design and diction, for quaint illustration and musical verse, they are not surpassed in the English language. From the days of Hudibras to our time, the drollery invested in rhyme has never been so amply or so felicitously exemplified; and if derision has been unsparringly applied, it has been to lash knavery and imposture.

**Memoriam.**—A poem by Alfred Tennyson, published in 1850, and consisting of one hundred and thirty "short swallow-flights of song," is a measure which Tennyson has made his own. It is well known that these "brief lays, of sorrow born," were written in memory of the author's friend, Arthur Henry Hallam, who died in 1833. They are characterised by George MacDonald as forming "the poem of the hoping doubters, the poem of our age—the grand minor organ-fugue of

*In Memoriam.* It is the cry of the bereaved Psyche into the dark infinity after the vanished love. His friend is nowhere in his sight, and God is silent. Death, God's final compulsion to prayer, in its dread, its gloom, its utter stillness, its apparent nothingness, urges the cry. Mournings over the dead are mingled with the profoundest

questionings of philosophy, the signs of nature, and the story of Jesus, while now and then the star of the morning, bright Phosphor, flashes a few rays through the shifting cloudy dark. And if the sun has not arisen on the close of the book, yet the aurora of the coming dawn gives light enough to make the onward journey possible and hopeful."

**Innocents Abroad.**—By Mark Twain. Travelers see Europe without any illusions. The fun consists in an irreverent application of modern common sense to historic associations, ridiculing sentimental humbug. An air of innocence and

**Instauratio Magna.**—The title (*The Great Restoration*) which Bacon gave to his *Magna Opus*, the design of which was for six divisions:—(1) *The Advancement of Learning*; (2) the *Novum Organum*; (3) the *Experimental History of Nature*; (4) the *Scala Intellectus*, which leads from experience to science (5) the *Baconic*, or anticipations of the second philosophy; and (6) *Active Science*, or experiment. Of these, only the first two, and

the portion of the third (*Sylvia Sylvestris*), were published. The idea that was to run through the *Intestines* was that invention must be based on experience, and experience must be based on invention. The hero is Sir Walter Sprotton. There, also, Ivanhoe, figures as Cedric of Rotherwood's disinherited son, the favorite of King Richard I., and the lover of the Lady Rowena, the daughter of the Sheriff of Norwiche. He was in England in the reign of Richard I., and we are introduced to Robin Hood in Sherwood forest, banquets in Saxon halls, tournaments, and all the pomp of ancient chivalry. Rowena, the heroine, is a young girl who is shaded by the gentle, mask, yet high-souled Rebecca.

**Jekyll, Doctor, and Mr. Hyde.**—A singular romance by Robert Louis Stevenson. The hero is a duplex character.—Dr. Jekyll and Mr. Hyde. Doctor Jekyll is a benevolent and upright physician, who by means of a potion is able to transform himself for a time into a second personality,

**Jerusalem Delivered.**—An epic in twenty books, by Torquato Tasso. The crusaders, encamped on the plains of Tortosa, chose Godfrey for their chief, and Alandine, king of Jerusalem, made

preparations for defense. The Christian army having reached Jerusalem, the king of Damascus sent Armida to beguile the Christians. It was found that Armida could never be taken without the aid of Rinaldo. He was so enamored that the hero was dallying with Armida in the enchanted island, sent to invite him back to the army; he refused. Armida then sent him to the East, and fled into Egypt, and offered to marry any knight who slew Rinaldo. The love of Rinaldo returned, he pursued her and she resisted. The poem concludes with the king of Damascus sending his army into the Holy City, and their devotions at the tomb of the Redeemer. The two chief episodes are the love of Armida and Sofronia, and of Tancred and Clorinda.

Julius Caesar.—An historical tragedy by William Shakespeare. The poet was in this, as in other plays, materially assisted by North's translation of Plutarch. "Shakespeare's *Julius Caesar*," says Halliwell, "is not equal, as a whole, to either of his other plays taken from the Roman history. It is inferior to *Antony and Cleopatra* in interest and power, and to *Antony and Cleopatra*. It, however, abounds in admirable and affecting passages, and is remarkable for the profound knowledge of character, in which Shakespeare

could hardly fail."—A novel by Sir Walter Scott. This is a very early work of the *Scotts* and *The Monastery*. For interest it comes next to *Kenilworth*, and the portrait of Queen Elizabeth is lifelike and correct. One of the chief beauties of the novel is the use of courtly gayeties and splendor, the novel contains the unhappy tale of the beautiful Amy Robsart, which cannot fail to excite our sympathy and pity. King Henry is a noble and generous monarch. Cordelia is a fabulous or legendary king of Britain. He had three daughters, and when four score years old, he was planning to divide his kingdom among them, but was persuaded to disinherit Cordelia. She became a play-actress, and a character Cordelia, who is a perfect woman.

**edy of Lyons, The.**—A drama, by Lord Lytton. In which Pauline Desceppelloni, daughter of a French merchant, rejects the suitor of Beaumont, a British officer, and marries the French nobleman, Claude, who was a gardener's son, aided by the other, passed himself off as Prince Coma. married Pauline, and brought her home to his father's house. Beaumont, who was a bankrupt, indignant, and Claude left her to join the French army. He became a colonel, and returned to his father's house (where he was a bankrupt), and that Beaumont had promised to satisfy the creditors if Pauline would consent to marry him. Pauline was heartbroken; Claude had obtained the money required, and carried home the bride.

ady of Shalott. The.—A poem by Alfred Tennyson, founded on an incident in *King Arthur*. It is descriptive of "a being whose existence passes without emotion, without changes, without intelligible motive for living on, without hope or fear here or hereafter."

ady of the Lake, The.—A poem in six cantos by Sir Walter Scott, published in 1810. "Measured even by the standard of the *Minstrel and Marion*, the *Lady of the Lake* possesses," says Palgrave, "merits of its own, which raised his reputation still higher. Jeffrey's prediction has been completely fulfilled, that the *Lady of the Lake* would be 'objectively immortal' in the formative, and it is generally acknowledged to be, in Lockhart's words, 'the most interesting, romantic, picturesque, and graceful of his great poems.'"

The descriptions of scenery, which form one of the chief charms of the poem, render it, even now, one of the most minute and faithful hand-books to the region in which the drama of Ellen and the Knight of Snowdon is laid.

and the Knight to snowbirds is also  
 Moore, consisting of four tales in verse, entitled  
*The Votied Prophet of Khorassan, Paradise and the Peri, The Five-Worshippers, and The Lapis of the Harem*, and connected by a short prose narrative, in which it is described how Lalla Rookh, daughter of the Emperor Aurangzebe, journeyed to Buchar to meet her betrothed husband, and how the prince gained her love on the way, in the guise of a cashmieran minstrel. *Lalla Rookh* was published in 1817.

**Amour.**—A descriptive poem by John Milton, probably written during his college life.

**Amour Meecin** (*is-mor' mee-dan'*), (or, *The Young Doctor*).—A comedy, written about the year 1655. Lucinde, the daughter of Spanarelle, is in love, and the father calls in four doctors to consult upon the nature of her malady. They see the patient, and retire to consult together, and then take turns to talk of the various topics of the day; and when the father comes to know what opinion they have formed, they all prescribe different remedies, and pronounce different prognostics. The first doctor, a young doctor (Chitandre, the lover), who says that he must act on the imagination, and proposes a seeming marriage, to which Spanarelle assents. The assistant being a notary, Chitandre and

**East Days of Pompeii. The.**—A novel by Bulwer-Lytton, Edward George, Baron Lytton, which was published in 1834. The interest of the book is one of







And his eyes have all the seeming of a demon's  
that is dreaming.  
And the lamp-light o'er him streaming throws  
his shadow on the floor;  
And my soul from out that shadow that lies float-  
ing on the floor

**Religio Medici.**—A prose work by Sir Thomas Browne, "*The Religio Medici*," says the elder Lytton, "is one of the most beautiful prose poems in the language; its power of diction, its subtlety and largeness of thought, its exquisite conceits and images, have no parallel out of the writers of that brilliant age when Poetry and Prose had not yet divided their domain, and the Lyceum of Philosophy was watered by the mixing of the wine!"

**Representative Men.**—A work by Emerson which more nearly than any of his other works, gives expression to his system as a whole. The topics are: (1) Plato, the Philosopher; (2) Swedenborg, the Mystic; (3) Montaigne, the Skeptic; (4) Shakespeare, the Poet; (5) Napoleon, the Conqueror of the World; (6) Goethe, the Writer. The mental portraits sketched under these six heads give us Emerson himself, so far as he is capable of being formulated at all.

**Republic, The.**—A work composed by Plato 400 years before Christ. The *Republic* is not, as the title implies, a political work, but a treatise on the *Politics* of Aristotle. The principles and government of an ideal moral organism, of which the rulers shall be types of fully developed and perfectly educated men, is the real subject. In the *Republic* we find the necessity of virtue to the very idea of social life proved in the first book; then the whole process of a complete moral and political education of the rulers is described. It is said that the most complete record of the beliefs or opinions of Plato are found in this work.

**Reveries of a Bachelor.**—By D. G. Mitchell. The *Reveries* is a collection of sketches of life and character, painted in such a dreamlike, delicate manner as to make the reader lose for the time being the full consciousness of his surroundings. It has called forth a number of imitators more or less successful, no one of whom, however, is comparable to the original.

**Reynard the Fox.**—A beast-epic, so called. This prose poem is a satire on the state of Germany in the middle ages. Reynard represents the Church; Isengrin the wolf (his lion) typifies the baronial element; and Ysaak the lion stands for the papal power. The plot turns on the struggle for supremacy between Reynard and Isengrin. Reynard uses all his endeavors to victimize every one, especially his uncle Isengrin, and generally succeeds.

**Nichelleu** (or, *The Conspiracy*).—A drama in five acts, by Edward, Lord Lytton; produced in 1839; the part of the hero being played by Macready. For some of the incidents the author confessed himself indebted to the authors of *Cing Mare* and *Ferriola*. Among the characters are Haradad, the favorite of the Muezzin, in love with Julie; Julie de Mortemart herself; Mon de Lormes, mistress of Orleans; Orleans himself; Louis XIII., and others.

**Rights of Man, The.**—"Being an answer to Mr. Burke's Attack on the French Revolution," by Thomas Paine. This work, which was published in 1791-2, procured for the writer the distinction of a trial for sedition, which he escaped by flying to France.

King of the Book. The. A poem by Robert Browning, published in 1869. It is the story of a tragedy which took place at Rome in 1698. The verified narrative of the child Pompilia's abduction by Count Guido's priest, the violence of her rescue by young aristocrats, the cruel, lawful separation, the murder by Guido of the girl and her putative parents, the trial and condemnation of the girl's father, the affirmation of his sentence by the pope—all this is made to fill out a poem of 21,000 lines; but these include ten different versions of the tale, besides the poem's prologue, the epilogue, and the epilogue's outline of it. The chapters which contain the statements of the priest-forever and Pompilia are full of tragic beauty and emotion. The pope's chapter is a masterpiece of prose, and the last piece of literary metempsychosis.

**Rip Van Winkle.**—A tale by Washington Irving, adapted from the old German legend of Peter Klaus, a goatherd, who drank a miraculous draught of wine in a delf of the Hare mountains, which brought on sleep from which he did not wake until twenty years after, when he returned to his native village to find everything changed, and no one who knew him. In Irving's tale the hero is a Dutchman living in America, and the scene is the Catskill mountains. The story has been made into a picture, and has been effectively dramatized, the leading personage being illustrated by the genius of Jefferson.

**Hivals, The.**—A comedy by Richard Brinsley Sheridan, produced at Covent Garden, London, in 1778, and described by Haslitt as "a play of even more action and incident, but of less wit and satire, than *The School for Scandal*." It is as good as a novel in the reading, and has the broadest and most palpable effect upon the stage.

**Roaring Camp, The Luck of.**—A prose sketch by Francis Bret Harte, an American poet, in which the softening effects of the presence of a little child in a camp of ruffians are very tonebly described. It has been dramatised for the New York stage.

**Rob Roy.**—A romance by Sir Walter Scott, which is founded on some passages in the career of the famous Highlander, Robert MacGregor, who was surnamed "Rob Roy." The heroine of the story is Diana Vernon, the heroine, Diana Vernon. Among the other characters are Bailie Nicol Jarvie, "The Dougal Cratur," and the "Black and White" of the title, Sir Frederick Vernon, and Rashleigh Oshadistotie. The novel has been dramatised in a version which still holds the stage in Glasgow, and is often spoken of as the "Rob Roy of the Scottish Stage." It is a story of the wealthy, but the friend of the poor, and possessed of many qualities, both of head and heart, who is at last proved to be a true and noble man, and then that to which his late condemned him."

**Romance of the Rose.**—A poetical allegory, begun by Guillaume de Lorris in the latter part of the thirteenth century, and continued by Jean Meung in the former half of the fourteenth century. The poet dreams that Dame Idleness conducts him to the palace of Pleasure, where he meets many adventures among the attendant maidens, Youth, Joy, Courtesy, and others, by whom he is conducted to a bed of roses. He singles out one, when an arrow from Love's bow stretches him fainting on the ground. Fear, Slander, and Jealousy are afterwards introduced.

**Romeo and Juliet.**—A tragedy by William Shakespeare. Romeo, a son of Montague, in love with Juliet, the daughter of Capulet; but between the houses of Montague and Capulet there existed a deadly feud. As the families were irreconcilable, Juliet took a sleeping draught, that she might get away from her parents and elope with Romeo. Romeo, thinking her to be dead, killed himself; and when Juliet awoke and found her lover dead, she also killed herself.

**Nemosa.**—A novel of Italian life and character by Giosuè Elci. Tells a marvellously able story of the revival of the taste and beauty and freedom of Hellenic manners and letters, under Lorenzo de' Medici and the scholars of his court, side by side with the revival of Roman virtue, and more than the ancient austerity and piety, under the great Dominican Savonarola. This period of history is one which all others may well be proud to have seen. It is the great East. Fringes of learning and discipline, amassed for mankind ages before, for ages stored and hidden away, see again the sun, are recognised and put to use.

What use they will be put to, with what new and fruitful effects on the state and the citizen, with what momentary and with what lasting consequences, this she strives to discover; this she follows through the public history of Italy during the modern invasion of Charles VIII., and the events which succeed his invasion, and through the private fortunes of her admirably chosen group of characters, some of them drawn from life, all of them true to nature.

Sagas.—Thus of the ancient traditions which form the substance of the history and mythology of the North, the sagas contain the best preserved remains. They are written in supposed to be the old Icelandic. In the *Edda* there are numerous sagas. A considerable number of the sagas are of a historical nature, songs, moral proverbs, and religious stories, so that the *Edda* contains the history of Norway, and the life of the great men of the country. The original *Edda* was compiled and edited by Harnud Sigfusson, an Icelandic priest who lived in the thirteenth century. It consists of twenty-eight parts or books, all of which are in verse. Of these, two hundred years later, Snorri Sturleson, a famous Icelandic poet, wrote a prose version, reduced to prose the *Edda*, and his work was called *The Younger Edda*. In this we find the famous story of the gods, and the lives of the heroes. Besides the sagas contained in the *Edda*, there are numerous others, and the whole saga literature is contained in a collection of books called the *Valdegar Saga*, which is a collection of lays about the early Teutonic heroes. The *Saga of St. Olaf* is a story of the life of the great king of Norway. The *Saga of the Volsungs* is a story of the life and adventures of Frithiof of Iceland. Snorri Sturleson, at the close of the thirteenth century, wrote a history of the sagas, and of chronicles in verse, called the *Heimskringling Saga*. This is a most valuable record of the laws, customs, and manners of the North.

**Sakuntala.**—A famous drama by Kalidasa. The daughter of Vyāmasita and a water-nymph who had been seduced by a hermit, she was brought up by a hermit. One day, King Dushyanta came to the hermitage, and persuaded Sakuntala to marry him. In due time a son was born, but Dushyanta left his bride at the hermitage. When the boy was six years old, his mother took him to the king, and Dushyanta recognised his wife by a ring which he had given her. Sakuntala was now publicly recognised queen, and the boy (whose name was Bharata), became the founder of the Chandra-vanshi dynasty. Bharata

**Samson Agonistes.**—A sacred drama by Milton. Samson, blind and bound, triumphs over his ene-

mies. As in the bible story, he grasps two of the supporting pillars, and perishes in the general ruin.

various *Resurrexits* (i. e., *The Tumor Patched*).—The title of an old Scotch ballad, being *The Last of the Opened* (i. e., *Hei! Tugendloschick*) in *The Books*, by Thomas Carlyle. It may be described as a kind of philosophical romance, in which the author gives us, in the form of a review of a supposed German work on dress, and a notice of the writer, his opinions on things in general. The hero, it has been said, seems to be intended for a portrait of human nature as exhibited by the author's audience; and such an cultivated mind would be exposed by acquaintance with the transcendental philosophy of Fichte.

**Scarlet Letter.**—The *A* romance by Nathaniel Hawthorne, published in 1850. The heroine, Hester Prynne, was condemned to wear certain marks as mother of her child, Pearl, whose father was not known. She was first exposed in disgrace, and afterward gained a moderate support for herself and child by embroidering. She was pardoned for her crime, but when she might then be allowed to lay aside the letter, H was always near, held as important position. Her husband, Arthur Dimmesdale, a minister, died. Hester Prynne took her child to another country, but returned to spend her old age in seclusion and contemplation. Pearl was brought back to her mother, and Dimmesdale was posthumously vindicated. She always bore herself proudly, but not defiantly, and refused to herself such love and respect that she regarded as her own. Her daughter, Pearl, a beautiful, worth, Hester's husband, appeared as a learned foreign physician, visited her in prison, but promised her to learning her secret. The characters in the story are intense, and the analysis of motives

**Schlemihl, Peter.**—The title of a little work by Chamisso, and the name of its hero, a man who sells his shadow to an old man in gray (the devil) who meets him just after he has been disappointed in an application for assistance to a nobleman. The name has become a byword for any poor, silly, and unfortunate fellow.

**Señor for Scoundrel, The.**—A comedy by Richard Brinsley Sheridan, produced at Covent Garden, London, 1777. Characterized by Hailstone as, "if not the most original, perhaps the most finished and faultless comedy which we have." The scene in which Charles Surface sells all the old family pictures but his uncle's, who is the purchaser, in disguise, and that of the recovery of Lady Teazle's jewels, are well told. "The play is the happiest and most highly wrought that comedy, in its wide and brilliant range, can boast. Besides the art and ingenuity of this play, there is a genial spirit of frankness and generosity, that relieves the heart as well as the lungs." While it is a comedy, it is not a comedy by any means, it inspires a confidence between man and man.

school for Wives (*L'École des Femmes* (training for wives)). A comedy by Molière. Arnolph has a crotchete about the proper training of grooms to make good wives, and tries his scheme upon Agnes, whom he adopts from a peasant's cottage. He sends her from early childhood to a convent, where difference of sex and the conventions of society are wholly ignored. When removed from the convent, and taken back, they were so well acquainted, that she treats him as a friend, and treats them with girlish familiarity. The consequence is, a young man named Horace falls in love with her, and makes her his wife, and

**Jealous of Husbands** (*L'École des Maris* (wives trained by men)).—A comedy by Molière. Ariste and Scapellato, two brothers, bring up Léonor and her sister, and teach them to conform to the social systems for making them in time their model wives. Scapellato's system was to make the woman dress plainly, live retired, attend to domestic duties, and have few indulgences. Ariste's system was to give the woman great liberty, and trust to her honor, Isabelle, brought up by Scapellato, deceived him and married another; but Léonor, brought up by Ariste, made him a faithful wife.

**Scottish Chiefs, The.**—A romantic story by Jane Porter, published in 1810, and counting among its heroes Robert Bruce and Sir William Wallace.

**Seasons, The.**—A series of poems by James Thomson, which appeared in the following order: *Winter*; *Summer*; *Spring*; and *Autumn*; the whole being republished, with the famous *Hymn*. Horace Walpole said that he would rather have written the most absurd lines by Lee than *The Seasons*; but Wordsworth, on the other hand, speaks of it as "a work of inspiration; much of it," he says,

**Sentimental Journey Through France and Italy.**—By Laurence Sterne, published in 1768. Sterne describes this work as follows: "It is a subject which works well, and suits the frame of mind in which I have been for some time past. I told you my design is it was to teach us to love









**Alelca.**—A fairy represented as carrying off Astolfo. She reappears in great splendor in Ariosto's *Orlando Furioso*.

**Aldibonathophosphoreum.**—A character in Henry Bury's burlesque of *Don Quixote*, called by the title of *Aldibonath*.

**Aldingar, Sir.**—A character in Percy's *Reliques*. This ballad relates how the honor of Queen Eleanor, wife of Henry Plantagenet, was saved by Sir Aldingar, her steward, who submitted to the chance of a duel, and how an angel, in the form of a little child, saved her from his claspings, and established her innocence.

**All Baba's.**—A poor Persian woodcarver of the Arabian Nights. He is recommended to leave the magic words, "Open Sesame!" "Shut Sesame!" by which he gains entrance into a vast cavern, the repository of stolen goods, and the lair of forty thieves. He makes himself rich by plundering from these stores; and by the shrewd cunning of Morgiana, his female slave, he obtains and his whole band of thieves are extirpated. In reward of these services, All Baba gives Morgiana her freedom, and marries her to his own son.

**Alice Braud.**—In Scott's *Lady of the Lake*, Alice signed Urgan the dwarf thrice with the sign of the cross, and he became "the fairest knight in all Scotland"; when Alice recognised in him her own brother, and married her to his own son.

**Alan-a-Dale.**—A friend of Robin Hood's in the ballad. He is introduced into Sir Walter Scott's *Invaders* as Robin Hood's minstrel.

**Alworthy, Mr.**—In Fielding's novel of *Tom Jones*, a man of amiable and benevolent character; intended for Mr. Ralph Allen, who was also celebrated by Pope.

**Almighty Dollar.**—A personification of American worship. Washington Irving originated the phrase in *The Great Valley*.

**Alp.**—Sveig of Corvyn, British. The hero of this poem.

**Amadis de Gaul.**—The hero of an ancient and celebrated Portuguese romance. A French version was printed in 1553.

**Amazilia.**—A young woman who impersonates spring in Thomson's *Seasons*.

**Amoryllus.**—In Spenser's pastoral *Cloth Clove's Great Home*, Amoryllus is the cousin of Desly. Her name was Alice, and she was the youngest of the six daughters of Sir John Spenser, of Althorpe, ancestor of the noble house of Spencer and Marlborough. After the death of the earl, the widow married Sir Thomas Greville, keeper of the great seal (afterward baron of Greville and Viscount Brackley). It was for this very lady, during her widowhood, that Milton wrote his *Lycidas*.

**Amrose.**—A sharper in *Tom Jones*. *Amrose*, who assumed in the presence of Gill Bliss the character of a devotee. He is a scoundrel, who, in the disguise of the name of Don Raphael, and a young woman who called herself Camilla, cousin of Donna Amrose. These three characters, Gill Bliss assumed the name of Don Raphael, and a young woman who called herself Camilla, cousin of Donna Amrose. These three characters, Gill Bliss assumed the name of Don Raphael, and a young woman who called herself Camilla, cousin of Donna Amrose.

**Amelia.**—The title of one of Fielding's novels, and the name of its heroine. Amelia is distinguished by her tenderness and affection. The character of Amelia is said to have been drawn from Fielding's wife.

**Amle.**—In Arabian Nights a female character who leads her three sisters by her side as a leash of hounds.

**Amleite.**—See *Précieux Ridicules*. Molière, A contradictory character in this comedy. She discusses her admirers for proposing to marry her, scolds her uncle for not carrying himself as a gentleman, and marries a valet whom she believes to be a nobleman.

**Amlet, Richard.**—The name of a gamster in Vanbrugh's *Confederacy*.

**Annet.**—(1) The name of a lady married to Sir Beudamere, in Spenser's *Fairy Queen*. She is the title of a devoted, loving wife. (2) The heroine of Fletcher's pastoral *Love's Pastoral Shepherdess*.

**Amys and Amylion.**—Two faithful friends. The Flies and Orestes of the *tragedy*. Their adventures are the subjects of ancient romances.

**Ancient Mariner.**—The chief character in Coleridge's *King of the Deserted Island*. (See under Famous Books, Poems, etc.)

**Amant Man.**—In Tennyson's *Idylls of the King*, means Merlin, the great magician, King Arthur's protector and teacher.

**Andrews, Joseph.**—The hero in Fielding's novel by the same name, written to ridicule Richardson's *Pamela*. Fielding presents Joseph Andrews as the title of the mother to the mother of *Pamela*, and pictures him as a model young man.

**Angelica.**—In Bojardo's *Orlando Innamorato*, is the daughter of Ginepro, king of Sicily, who goes to Paris, and Orlando falls in love with her. Forgetful of wife, sovereign, country, and glory, Angelica, on the other hand, is loved by Orlando, but passionately loves Rinaldo, who positively dislikes her. Angelica and Rinaldo drink of certain fountain, whereupon they are changed in their hearts, for then Rinaldo loves Angelica, while Angelica loves all love for Rinaldo. (2) The heroine of Congreve's comedy, *The Love for Love*, in love with Valentine, but the ward of Sir Sampson Legend, who seeks to marry her. She kills the old man, however, and marries the

younger lover. Angelica is supposed to represent Mrs. Mordaunt. Valentin, the author, was the rival of the dramatist, Rowe, in her affection. (3) The heroine of a novel by the same name, who was beloved by Orlando, but married Medoro. Also the name of the heroine of Targuier's plays of the same name, who was the subject of a needie. He was also called the Angel of the Rebekah.

**Angelica Doctor.**—A name bestowed upon Thomas Aquinas, because he discussed the knotty point of the angel's single eye, and the point of a needie. He was also called the Angel of the Rebekah.

**Ann.**—A character in Shakespeare's *Measure for Measure*; also the name of a goldsmith in the *Comedy of Errors*.

**Annabel Lee.**—The title and subject of a poem by Edgar Allan Poe, which begins in this way: "It was many and many a year ago, In a kingdom by the sea."

That a maiden there lived whom you may know By the name of Annabel Lee.

**Anne.**—Perrault's *Le Barbe Bleue*, the sister of Fatima, the seventh and last of the seven daughters of a king, having disobeyed her lord by looking into the locked chamber, is allowed a short respite before execution. Sister Anne ascends the high tower of the castle, with the hope of seeing her

sister, whom she expected to arrive every morning. In her attempt, she is killed by the "sister Anne" if she can see them, and Bluebeard keeps crying out for Fatima to use greater dispatch. At the close of both tales, the king comes to arrive, and Fatima is rescued from death.

**Annie Laurie.** eldest of the three daughters of Sir John Laurie, of Craigheroch, and was the mother of Alexander Ferguson, the hero of the *Waverley*. The song of *Annie Laurie* was written by William Douglas, of Fingland, in the epilogue of *Kirkcubright*, hero of *Scotland's*.

**Antipholus of Ephesus, Antipholus of Syracuse.**—Twin brothers, sons to Egeon and Antis, in Shakespeare's *Comedy of Errors*.

**Antiope.**—(1) The merchant of Venice in Shakespeare's play of that name, the friend to Bassanio, and the object of Shylock's hatred. (2) The usurping Duke of Milan, and brother to Prospero, in Shakespeare's *Tempest*. (3) The father of Pericles, in Shakespeare's *Pericles*. (4) A minor character in Shakespeare's *Much Ado About Nothing*. (5) A sea-captain, friend to Pericles, in Shakespeare's *Pericles*.

**Archimago.**—A character in Spenser's *Fairy Queen*, a hypocrite or sorcerer. He is introduced in the Red Cross Knight, wins the confidence of the knight in the disguise of a reverend hermit, and helps him to defeat the Duke of Ufford, separates him from Una, or Truth.

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historical traditions. The Arthur of the old Welsh bards was a warrior chieftain, ruling a race of warlike tribes. Every generation of poets has added something to the picture until the Arthur of modern romance is a Christian great king. Tennyson pictures him in his *Idylls of the King* surrounded by his chivalrous knights, all bound to him by the ties of friendship.

**Arthur's Sword.**—Excalibur or Escalibur. Geoffrey calls it Caliburn, and says it was made in the island of Avalon.

**Arthur's Round Table.**—It contained seats for 150 knights. Three were reserved, two for honor, the third for the king, as a precaution against the king, had destined to achieve the quest of the Holy Grail.

**Ashton, Sir William.**—The Lord keeper of Scotland, a prominent character in Scott's *Brave of Lammermoor*.

**Asmodeus.**—In the Jewish demonology, an evil spirit, the demon of vice, dress, in modern times he has been spoken of as the destroying demon of matrimonial happiness.

**Aspidochelone.**—The unfortunate medicine of Beaumont and Fletcher's play *The Maid's Tragedy*.

**Astolot.**—The home of Elaine in Tennyson's *Idylls of the King*.

**Ataliole or Astolpho.**—A celebrated character in the romantic tales and poems founded upon the supposed adventures of Charlemagne and the Valadine. (See also *Orlando Furioso*.)

**Athalia.**—Athalia, Racine. Daughter of Ahab and Jezebel, who usurped the throne of Israel.

**Atburn.**—The name of a village immortalized by Oliver Goldsmith in his *Deserted Village*; it has been identified with Lissey, in Ireland, near Athlone.

**Atreus.**—A country wench, in Shakespeare's *Titus Andronicus*.

**Atreus.**—The earliest of thieves. He stole the cloak of the demon of vice, dress, in modern times he has been spoken of as the destroying demon of matrimonial happiness.

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the phrase "Caliban speech," "Caliban speech," meaning the coarsest possible use of words.

**Calidore.**—A knight in the *Quest of the Holy Grail*, typical of courtesy, and said to be intended for a portrait of Sir Philip Sidney.

**Calista.**—The name of a celebrated character in *Romeo's Fair Penitent*.

**Callipolis.**—*Baron of Alcazar*, George Peele. A character in the *Baron of Alcazar*, created by Sir Walter Scott and others as a synonym for lady-love, sweetest, charmer. Sir Walter always calls the word Callipolis, but Peele calls it Callipolis.

**Calypso.**—A forest celebrated in the romances relating to King Arthur and the Grail.

**Camararianism, Prince.**—*Arabian Nights*. One of the stories of the *Arabian Nights* and the name of a prince who fell in love with Hourara, princess of China, the moment he saw her.

**Camarero.**—*Don Quixote*, Cervantes. A character in an episode in *Don Quixote*, gets cheated out of his bride after having made great preparations for their wedding.

**Cambray, or Cambel.**—*Fairie Queen*, Spenser. A brother of Candace. He challenged every suitor to his sister's hand, and overthrew all except Triamond, who married the lady.

**Cambala.**—In the *Voyage of Marco Polo* the chief city of the province of Cathay.

**Cambucan.**—A king of the kingdom with Genghis Khan. The king of the far east sent Cambucan a "steed of brass, which, between sunrise and sunset, would carry the rider to any spot on the earth." All that was required was to whisper the name of the place in the king's ear. When the rider had arrived at the place required, he had to turn another pin, and the horse instantly descended, and, with another sweep of the pin, vanished till it was again required. This story is begun by Chaucer in the *Squire's Tale*, but was never finished.

**Camelot.**—A parish in Somersetshire, England now called Glastonbury. The name Camelot is said to have held his court. In this place there are still to be seen vestments of an ancient king of a station—called by the inhabitants Arthur's Palace.

**Camilla.**—(1) The virgin queen of the Volscians, famous for her defense of Coriander against the Romans. (2) Wife of Anselmo of Florence in *Don Quixote*. Anselmo, in order to rejoice in her incorruptible fidelity, induced his friend Lotherio to try to corrupt her. This he did, and Camilla was not true-proof, but tell. Anselmo died a time was kept to the point, but at the end Camilla eloped with Lotherio. Anselmo died of grief, Lotherio was slain in battle, and Camilla died in a convent.

**Camille.**—(1) In Corneille's tragedy of *Les Horaces*. When her brother meets her and bids her make him his victor, she overthrew her friend she gives utterance to her grief for the death of her lover. Horaces says, "Canst you prefer me to the interests of Rome, but at the end Camille desecrates Rome, and concludes with these words: "O! that it were my lot." (2) Whitehead dramatized the subject and called it *The Roman Father*.

**Canace.**—*Fairie Queen*, Spenser. A paragon among women, the daughter of King Cambucan to whom the king of the East sent as a present a mirror and a ring. The mirror would tell the lady if any man on whom she set her heart would prove true or false, and the ring (which was to be worn on her thumb) would enable her to understand the language of birds and to converse with them. Canace was courted by a crowd of suitors, but her brother gave out that any one who pretended to her hand must encounter him in single combat and overthrow him. She ultimately married Triamond, and her brother was slain.

**Candide.**—The hero of Voltaire's novel so called. All sorts of misfortunes are heaped upon him, and he bears them all with philosophic indifference.

**Candor, Mrs.**—A most energetic slanderer in Sheridan's *School for Scandal*.

**Caora.**—*Description of Gwynne*, Raleigh. A river, on the banks of which are a people whose heads grow beneath their shoulders. Their eyes are in their shoulders, and their mouths in the middle of their breasts. The original picture is found in Hakluyt's *Voyage of 1590*.

**Capulet.**—The head of a noble Venetian house in Shakespeare's tragedy of *Romeo and Juliet*, hostile to the house of Montague. He is at times self-willed and tyrannical, but a jovial and testy old man.

**Capulet, Lady.**—The proud and stately wife of Capulet, and mother of Juliet.

**Candace.**—A king, or queen, of the Round Table. Also in history, the British chief whom the Romans called Caracalla. Candace is the hero of an old ballad entitled *The Fair Maid of Perth*.

**Carker.**—A soundly clerk in Dickens' *Dombey and Son*.

**Carion, Midway.**—A hero transformed by unselfish love in Dickens' *Tale of Two Cities*. He voluntarily goes to the guillotine to save his successful rival in love.

**Casca.**—*Julius Caesar*, Shakespeare. A blunt-witted Roman, one of the conspirators against Julius Caesar.

**Cassandra.**—A daughter of Priam, king of Troy, gifted with the power of prophecy; but Apollo, who refused to reveal the future to her, left her no one believed her predictions. Shakespeare makes use of this character in *Troilus and Cressida*.

**Cassio.**—The name of a Cymbeline, in Shakespeare's play by that name.

**Cassio.**—A Florentine, and lieutenant of Othello, who is slain in Cassio's tragedy. Othello, Iago made Cassio drunk, and then set on Rodrigo to quarrel with him. Cassio wounded Rodrigo, and Othello sent him into banishment. Iago induced Desdemona to plead for his restoration. This interest in Cassio confirmed the jealous rage of Othello to murder his wife and kill himself. After the death of Othello, Cassio was appointed governor of Cyprus.

**Cassio, Douglas.**—A hero belonging to the Douglas family, which gives its name to one of Sir Walter Scott's *Tales of My Landlord*. It was so called by the English because it was always retained from them by the Douglas.

**Cassio of Indolence.**—The title of a poem by Thomson, and the name of a castle described in it as situated in a pleasing land of downiness, where every sun was steeped in the most luxurious and enervating delights.

**Castlewood, Beatrice.**—The heroine of Thackeray's novel *Henry Reckless*, a picture of splendid, luxurious, but imprudent life.

**Caudle, Mrs. Margaret.**—The feigned author of a series of current lectures by Douglas Jerrold, published in 1843, purporting to be lectures delivered by Mrs. Margaret Caudle to her patient husband. The lectures are between the hours of ten at night and seven in the morning.

**Cauline, Sir.**—A knight in Percy's *Reliques*, who is slain in the battle of Ireland. He fell in love with Christabelle, the king's daughter, and she became his troth-plough wife, without her father's consent. When the king learned this, he banished Sir Cauline. After a time the soldier asked the lady in marriage, but Sir Cauline challenged him and slew him. The king's daughter, ever, died of the wounds he had received, and the Lady Christabelle, out of grief, "burst her gentle breast" and died.

**Cecilia, St.**—A patron saint of the blind, also patroness of musicians, and "inventor of the organ." According to tradition she was in love with her father's musical skill, and used nightly to visit her.

**Cecilia, St. Ursula.**—Lovers of matchless beauty and most devoted to each other. Being overtaken by a thunderstorm, Amelia became alarmed, but she was saved by the king's daughter, who, in safety to be near her, sure; but while he spoke Amelia was struck by lightning and fell dead in his arms.

**Celia.**—*Fairie Queen*, Spenser. (1) Mother of Faith, Hope, and Charity. She was herself personified. (2) Celia, cousin to Rosalind in Shakespeare's *Comedy As You Like It*. Celia is a beautiful person, and her name is derived from the word *celare*, to hide.

**Chadband, The Rev.**—A clerical character in Dickens' *Black House*. He will always stand as a type of hypocritical piety.

**Chanticleer.**—The cock, in the tale of *Reynard the Fox*, and in Chaucer's *Nominalia* *Reynard* *Tale*.

**Charlemagne.**—The romance of Charlemagne and his paladins is of French origin, as the romance of the Round Table and the Knights of the Round Table is of Celtic or Welsh origin. According to one tradition Charlemagne is not dead, but waits around and armed, in Aachen, near Salzwedel, till the time of anticrist, when he will wake, and deliver Christendom. According to another tradition, Charlemagne appears in season of plenty. He crosses the Rhine on a golden bridge, and blesses both cornfields and vineyards.

**Charlot.**—A rival attendant on Cleopatra, a misguided female attendant on Cleopatra in Shakespeare's play of *Antony and Cleopatra*.

**Chastelard.**—The name of *Anna's Fairies* *Tales*. Two children of royal birth, whom their father's brothers and their mother's sisters cast away, and are found brought up by a poor cornair and his wife. Ultimately they are told of their birth by a green bird and marry each other.

**Cheerful Brothers.**—The name of a benevolent London merchants in Dickens' *Nicholas Nickleby*.

**Childe.**—The name of a knight in Longfellow's *Hiawatha*, personifying harmony in nature.

**Children in the Wood.**—Two characters in an ancient and well-known ballad entitled *The Children in the Wood*, or *The Norfolk Girl's Last Will and Testament*. This is said to be a disguised record of the alleged murder of his nephews by Richard III.

**Chiefly Bulwer.**—The hero in a novel by this name.

**Chingachcook.**—A sagamore of the Mohicans, and father of Uncas, in Cooper's *Leather-Stocking Tales*.

**Chloe.**—Daphnis and Chloe, Longus. (1) The shepherdess loved by Daphnis. (2) Paul and Virginia by St. Pierre is founded on this romance. (3) The name of a shepherdess in Shakespeare's *As You Like It*.

**Cherries.**—The lover of Callirhoë, in Chaucer's *Greene romance*.

**Cherimelmo, or Chermelmo.**—The heroine of the German epic poem, the *Nibelungenlied*. She is represented as a woman of great beauty and beauty, and rich beyond conception. By the treacherous murder of her husband she is transformed into a being of evil and vengeance. For plot of this epic poem, see Kriemhild.

**Christabel.**—(1) The subject and heroine of an old romance by Keats, entitled *Christabel*. (2) The heroine of an ancient ballad *Sir Christabel*. (3) The lady in Coleridge's poem *Christabel*.

**Christiana.**—The name of a heroine in an allegory *Pilgrim's Progress*. She flees from the "City of Destruction," and journeys to the "Celestial City." She is with her brother, George, and her mother, but it falls off when he stands at the foot of the cross. All his trials on the way are depicted.

**Christina.**—The name of a heroine in the "City of Destruction" forms the subject of Bunyan's *Pilgrim's Progress*, part. She was placed under the guidance of Mr. Great-Heart, and met her husband at the Celestial City.

**Christopher, St.**—The saint that carried a child over a brook, and said, "Chyldre, thou hast put me in greet peryll, I might have no greater reward." The Chyldre was the Christ and the burden was the "Sin of the World." This has been a favorite theme for painters.

**Chrysippe.**—A friend of Anaxagoras.

**Chrysippe.**—An honest, simple-minded, bespeckled character in *Don Quixote*, translated by Motley.

**Chuzzlewit, Martin.**—The hero of Dickens' novel the *Chuzzlewits*.

**Chuzzlewit, Jonas.**—A miser and a murderer, the opposite type of character from Martin.

**Cimmerians.**—A people described by Homer dwelling beyond the ocean-strait, in a land where the sun never shines.

**Cinderella.**—Heroine of a fairy tale. She is the daughter of a poor old man, and goes to live with a rich man. At length a fairy enables her to go to the prince's ball, the prince falls in love with her, and she is discovered by her mother and her slipper which she drops, and which will fit no foot but her own. She is represented as returning good for evil and being a kind and self-sacrificing every kindness a princess can show.

**Cingano.**—A marvelous island, described in the *Voyage of Marco Polo*. A Venetian traveler, it is represented as lying in the eastern sea, some 1,500 miles from land, and of its beauty and wealth many stories are recorded. It has been a favorite navigators made a diligent search for this island.

**Claire.**—A female character in *Chatterbox's Legend*, noted for her beauty and devotion.

**Claire, Ada.**—The wife of Carstone, and one of the most important characters in Dickens' *Black House*.

**Clavieno Aligero.**—The wooden horse on which Don Quixote got astride in order to dismount the giant of Montalban, and the name of the Countess Trifaldi. It was the very horse on which Peter of Provence carried off the fair Magdalene, and was called by Merlin.

**Clavieno.**—The name of a horse in the forest, which was governed by a wooden pin in the forehead.

**Cleante.**—Brother-in-law of Orgon in Molière's *Tartuffe*. He is distinguished for his genuine piety, and is both loud and compassionate. The same name occurs in two other plays by Molière.

**Cleebobham, Jedediah.**—Schoolmaster and parish clerk of Ganderuech, who employed his assistant teacher to arrange and edit the tales told by the landlord of the Wallace Inn of the same parish. These tales the editor disposed of three series, each by a different title, and the name of *My Landlord*. Of course the real author is Sir Walter Scott.

**Clemence, Lady.**—A beautiful and accomplished woman, deeply in love with Sir Charles Grandison, in Richardson's novel of this name.

**Cleen.**—The name of a heroine in a romance, governor of Tarnus, burned to death with his wife Dionysia by the enraged citizens, to revenge the supposed murder of a woman, daughter of Prius, prince of Tyre. (2) The personification of glory in Spenser's *Fairie Queen*.

**Clifford, Paul.**—An attractive highwayman and an ideal hero in a novel by the same name. He is familiar with the haunts of low vice and dissipation, but afterward is reformed and elevated by a woman, and is called by the name of *Clifford*.

**Cleoten.**—A rejected lover of Imogen, in Shakespeare's play of *Cymbeline*.

**Cleopatra.**—The name of a queen, Cleopatra, the heroine of this poem, is represented as an Egyptian queen, and is represented as a woman, especially in the Christian chief Tancred; yet she is herself susceptible of no passion but the love of power.

**Clein, Colin.**—A name that Spenser applies to himself in the *Fairie Queen* and *Shepherd's Calendar*. Colin is a name which is used in the poem to represent himself.

**Cock, The.**—A famous tavern in Fleet street, London, opposite the Temple. Tenynson has immortalized it in his *Wit Waterpocket's Legend Monologue*.

**Corleis.**—The hero of a novel by Hannah More, *Corleis in Search of a Wife*.







**Galapah.**—A giant of marvelous height in the army of Lucius, king of Rome. He was slain by King Arthur.

**Galaphone or Galafon.**—A king of Cathay and father of Angulo in *Hojardo's Orlando Furioso* and Ariosto's *Furioso*.

**Gamp, Mrs.**—A nurse who is a prominent character in Dickens' novel of *David Copperfield*. She is celebrated for her constant reference to a certain Mrs. Harris, a purely imaginary person, for whose opinion she professes the greatest respect, in order to give the more weight to her own.

**Gan, Ganelone, Ganelon or Gano.**—The character of Sir Ganelon has been marked with spite, dissimulation, and intrigue, but he was patient, obstinate, and enduring. He loved solitude, disbelieved in the existence of more good, and has become a byword for a false and faithless friend. Dante has placed him in his *Inferno*.

**Gander-Clegg.**—"Folly-Cliff," that mysterious place where a person makes a goose of himself, in *Tales of My Landlord*, Sir Walter Scott.

**Garcia, Pedro.**—A mythical personage, of whom mention is made in the preface to *El Blue*, in which is related how two scholars of Salamanca discovered a tombstone with the inscription "Here lies interred the soul of the Lixentista Pedro Garcia," and how, on digging beneath the stone, was found a leather purse containing a hundred ducats.

**Gareth.**—In *Arthurian Romance* a knight of the Round Table, who was first a scullion in King Arthur's kitchen. He was married to the daughter of the Lady Liset, or Lynette, whose sister Lione, or Lyonesse, he delivered from Castle Giron.

**Gargamelle.**—The mother of Gargantua in Rabelais' celebrated romance of this name.

**Gargery, Mrs. Joe.**—In *David Copperfield*, Dickens. Pip's sister. A virago, who kept her husband and Pip in constant awe. Joe Gargery, a blacksmith, married to Pip's mother. A severe, but simple-minded young man, who loved Pip sincerely. Joe Gargery was one of nature's gentlemen.

**Gargery or Gargery.**—The child, one of the three magi or kings of Calicut. He offering to the infant Jesus was frankincense, in token of divinity.

**Gannet, Griffith.**—Hero of a novel by Charles Reade, of name and title.

**Gavotte.**—Name given to a certain dance common among people in the upper Alps.

**Gawain, Sir.**—One of the knights of the Round Table, and one of the most celebrated knights of the Round Table; noted for his sagacity and wonderful strength. He was summoned to the court of King Arthur. His brothers were Aggravaine, Gaheris, and Gareth.

**Gebir.**—A legendary eastern prince, said to have subdued Africa and led his army to the island of Gibraltar. He is the subject of a poem of the same name by Walter Scott's son.

**Gellatley, Davy.**—The name of a poor fool in Sir Walter Scott's novel of *Waverley*.

**Genevieve.**—(1) The heroine of a ballad by Coleridge. (2) In *Græce's*, the name occurs in a German myth as that of the wife of the Count Palatine Siegfried, in the time of Charles Martel. Upon false accusations her husband gave orders to put her to death, but the servant intrusted with the commission suffered her to escape into the forest of Ardennes, where, being concealed, until by accident her husband discovered her retreat, and recognized her innocence.

**Genetrix.**—A lady in Ariosto's *Orlando Furioso*. Her honor is impeached, and she is condemned to die unless a champion appears to do combat for her. Her lover, Ariostander, answers the challenge, kills the false accuser, and weds the dame. Spenser has a similar story in the *Fairie Queene*, and Shakespeare a varied kind of it in the character of his comely of *Much Ado About Nothing*.

**Gerald, Sir.**—One of the knights of the Round Table. His name is told in *Chaucer's Tale of the King under the Green Tree*.

**Geraldine.**—A name frequently found in romantic poetry, especially Scott's *Lays of the Last Minstrel*. The name is said to have been adopted from the heroine, connected with Surrey, whose praises are celebrated in a famous sonnet.

**Gertrude of Wyoming.**—Heroine of a poem by Thomas Campbell.

**Gisour.**—Byron's tale called *The Giaour* is represented as told by a fisherman, a Turk, who had committed a crime which haunted him all his life. See *Hassan*.

**Gibbie, Goose.**—A half-witted boy in Scott's *Old Mortality*.

**Gibbie, Sir.**—A simple-beated, fine character in George MacDonald's novel by the same name.

**Giant Brepast.**—A name of the giant Brepast. A giant who is the owner of Dogwood Castle, and who, finding Christian and Hopeful asleep upon the grounds, takes them prisoners, and thrusts them into a dungeon.

**Giant Grim.**—*Pilgrim's Progress*, Bunyan. A giant who seeks to stop the progress of the pilgrims to the Celestial City, but is slain in a duel by Mr. Great-heart, their guide.

**Giant Gray-goose.**—*Pilgrim's Progress*, Bunyan. A giant slain in a duel by Mr. Great-heart.

**Glaucus.**—A fisherman of Berotia who has become the fisherman's patron deity.

**Glaucus.**—Son of Hippolytus. Being smothered in a tub of honey, he was restored to life by *Asclepius*.

**Glennora.**—In Spenser's *Fairie Queene*, the "greatest virtuous queen of Fairy land."

**Glimmering Fens.**—Thames. Fielding. Queen of the giants, captive in the court of King Arthur.

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her to the castle of King Jonakun, who became her third husband.

**Gherard.**—A northern poem. A model of heroic fortitude and pious resignation. She was the daughter of King Hietri (Attila), and the betrothed of King Hietri.

**Guendolen.**—A fairy whose mother was a human being.

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**Malte.**—In German legend, an archbishop of Meits in the tenth century who, for his hardness to poor and rich alike, was banished to the east by mice in the "Mouse Tower" on an island near Rhine near Bingen. His cruelty has made this legend the subject of a poem.

**Marek.**—The Dane.—A fisherman, known as a rescuer of the drowned, was adopted by the king of Denmark, and when the boy was restored to his royal sire, Grims was the name which he built the town which he called after his own name. This is the foundation of the medieval tales in *Hamlet* the Dane.

**Marewood.**—Sir Robert.—The old baronet of Marewood.

**Marewood, Charles.**—Guy Manning. Scott, son of Sir Robert. In love with Lucy Bertram.

**Heart of Midlothian.**—The tollbooth, or old jail of Edinburgh, Midlothian being the old name of Edinburgh county. It is the title of one of Sir Walter Scott's novels.

**Heep.**—Urbah.—David Copperfield, Dickens. A detestable character, who, under the garb of the most abject humility, conceals a diabolical malignity. Mrs. Heep, Urbah's mother, was a character equally to be despised for her hypocritical assumption of humility.

**Helen.**—(1) A lady in Shakespeare's *Midsummer Night's Dream*, loved by Demetrius. (2) The heroine of Shakespeare's *All's Well That Ends Well*, in love with Bertram, who marries her against his will and leaves her, but is won back by the strength of her affection. (3) A character in an old popular tale, reproduced in Germany by Tieck.

**Helen and Dorothea.**—The hero and heroine of Goethe's poem of the same name.

**Hermegild.**—*Canterbury Tales*, Chaucer. The wife of the lord-constable of Northumberland. She was converted by Constantine, but was murdered by a knight, Hermegild at the bidding of Constantine restored again to a blind Brind.

**Hermione.**—A lady in Shakespeare's *Midsummer Night's Dream*, in love with Lysander.

**Hernando.**—The heroine of the first three acts of Shakespeare's *Henry VIII.*

**Hernani or Hernani.**—The hero of Victor Hugo's drama of the same name, and of the opera, founded on the play. He was a Spanish noble in revolt against the Emperor Charles V. and killed him from a high seat of honor.

**Hilda.**—A New England girl of the most sensitive delicacy and purity of mind, in Hawthorne's *Mosses from an Old Manse*.

**Hildebrand.**—The hero of German romance, a champion and champion.

**Hildebrand.**—In an old German legend, the monk of Hildesheim, doubting how a thousand years ago with God could be so kind to the melody of a bird, as he supposed, for only a thousand years, but found he had been listening to it for a hundred years.

**Hobbes.**—The name of one of the fends mentioned by Shakespeare in *Love*, and taken from the history of the Jesuits' impostures.

**Hobbes.**—A famous German kobold, or domestic fairy-servant, so called because he always wore a little felt hat pulled down over his face.

**Hobbes.**—(1) A pedant living in France, under whose care Gargantua is placed for instruction. (2) A pedantic schoolmaster in Shakespeare's *Love's Labor's Lost*.

**Holt, Felt.**—The hero of George Elliot's novel by the same name.

**Homer.**—The later entries in the *Peterborough Chronicle* and a few homilies are almost all that we have left of the literature of the twelfth century. Some of these homilies are copied or imitated from those of *Willelme*.

**Honeycomb, Will.**—One of the members of the literary club who were the subject of a satirically edited. He is distinguished for his graceful affectation, courtly pretension, and the design of the eye.

**Honeyman, Charles.**—A fashionable preacher in *Blackbury's* novel, *The Newcomes*.

**Honeyman.**—A pious but hypocritical *Virgin's Progress*, who accompanies Christian to the end of his journey.

**Hop-o-my-thumb.**—A character in the tales of the nursery. Tom Thumb and Hop-o-my-thumb have the same name, although they are often confounded. Tom Thumb was the son of a peasant, knighted by King Arthur, and was killed by a giant. Hop-o-my-thumb was a boy of the same name as the German "däumling," the French "le petit pouce," and the Scotch "Tom-in-ee" or "Tommy." He was not a handsome boy, but a good one.

**Hornet.**—*Hamlet*, Shakespeare. An intimate friend of Hamlet, a prince, a scholar, and a gentleman.

**Hornet.**—*Hamlet*, Shakespeare. A man who came over the Tiber. He and two men to help him held the bridge against vast approaching armies.

**Hornet, Jack.**—The name of a celebrated personage in the literature of the nursery. A benevolent philanthropist says that the plume which Jack Hunter pulled out of the Christmas pie alluded to the title of the abbot of the abbey of St. Albans, which was given to Henry VIII. in a party, and were attracted on the way by the messenger, a certain Jack Hunter.

**Hortense.**—*Black House*, Dickens. The vindictive French maid-servant of Lady Dedlock. She was the subject of a parody about her by Lady Dedlock. Rosa, Hortense murdered Mr. Tulliver, and drew the suspicion of the crime on Lady Dedlock.

**Hortense.**—A prince in the Arabian Nights who would marry his wife's white-servant he wished.

**Hubbard, Old Mother.**—A well-known nursery rhyme. The subject of a parody about her by Edmund Spenser, is a satirical ballad in the style of Chaucer.

**Hubert de Burgh.**—Justice of England, created Earl of Lincoln, was introduced by Shakespeare into *King John*. He is the one to whom the young prince addresses his pious plea for his life. He is killed by Richard, the first duke, by accident or foul play.

**Hudibras.**—The legend of Saint Hubert makes him a patron saint of huntmen.

**Hudibras.**—The title and hero of a celebrated satirical poem by Samuel Butler. Hudibras is still his favorite of the time of the commonwealth.

**Hugh of Lincoln.**—A legendary personage, the subject of Chaucer's *Prologue*, *Parson's Tale*, and also of an ancient English ballad. Wordsworth has given a modernized version of this ballad.

**Hugo Huguenot.**—*Caste Dangerous*, Scott. Minstrel of the earl of Douglas.

**Hump.**—The subject of a collection of the tales in *Master Humphrey's Clerk*, by Charles Dickens.

**Humpty Dumpty.**—The hero of a well-known nursery rhyme. The name signifies a humped and dumpty and is the riddle for an egg.

**Hun of Bordeaux.**—Sir.—A hero of one of the legends of the time of the crusades.

**Hural Oryan.**—In the fairy tales found in the Koran, these are the black-eyed daughters of Oryan, who are created from mud, and are free from all physical weakness and are always young. It is held out to every male believer that he will have a hundred of these girls as his household companions in paradise.

**Hylas.**—A beautiful boy, beloved by Hercules, who was drawn into a spring by the enamored nymphs. The story has been treated by Bayard Taylor, and by William Morris in his *Life and Death of Hylas*.

**Hypocrit.**—The Feast of Purification is called *Feast of Hypocrit*.

**Hypocrit.**—The myth has formed a favorite theme for English poets. In Keats' *Hyperion* nature and classic imagery are combined with the myth.

**Hypocrit's Isle.**—An island described by Rabelais in one of his satires. He pictures this island of the world inhabited by the most vicious and debilitated natures, as by sham-saints, spiritual comedians, seducers, and such-like sorry rogues who have been driven to the island of the *Isle of Lament*.

**Hypocrit.**—Shakespeare. Othello's enigm and the villain of the play. Iago is said to be a character next to a devil, yet not quite a devil, which Shakespeare alone could conceive without scandal.

**Idleness.**—The Lake of.—*Patric Queens*, Spenser. Whoever drank thereof grew instantly "faint and weary." The Red Cross knight drank of it and was readily made captive by Orgoglio.

**Idleness.**—*Patric Queens*, Spenser. Fosterer of Orgoglio, Spenser says this old man walks one day and looks another, because idleness is always "wrong-headed."

**Imogen.**—The wife of Ptochomus, and the daughter of Cymbeline in the play of Shakespeare's under title *Cymbeline*. "Of all Shakespeare's women," says the poet, "she is, perhaps, the most tender and the most artless."

**Impratori.**—Poets who utter verses without previous preparation on a given theme. Among the Greeks, the Greeks were the subject of a parody. In modern times, it has been almost entirely confined to Italy, where Petrarch was the first to practice of singing improvised verses to the lute.

**Incantation.**—Is derived from a Latin root meaning "to enchant." It is the term used to denote one of the most powerful and awe-inspiring modes of magic, resting on a belief in the mysterious power of words solemnly conceived and passionately uttered.

**Incense Rock.**—It is dangerous for navigators, and therefore the sailors of the Alps are called to a hill on a storm, where they go to sleep. Southey says that Ralph the Rover, in a mist, fell into the sea, but on his return voyage his boat ran on the rock, and Ralph was drowned. Presumably, the rock is the same as the *Incense Rock*.

**Inferno.**—*The Divine Comedy*, Dante. Epopee in thirty-four cantos. Inferno is the place of the souls who are where they go to. The ascent is through Purgatory to Paradise.

**Interludes.**—The springing from the moralities and the religious plays, these were, however, never the regular drama, are the interludes, a class of compositions in dialogue, much shorter than the regular drama, and farcical. They were usually played in the intervals of a festival.

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**Iphigenia.**—The heroine of Euripides' tragedy *Iphigenia at Aulis*, and of Goethe's tragedy *Iphigenia at Aulis*. Her place on the altar in a rash vow by her father, Artemis at the last moment saved her from sacrifice, and she went to heaven, substituting a hind in her place. The similarity of this legend to the offering of Isaac by Abraham is noticeable.

**Iras.**—A strongly delineated character in *Ben Hur*, by Lew Wallace.

**Iras.**—A female attendant on Cleopatra in Shakespeare's play, *Antony and Cleopatra*.

**Isaac.**—The name of Isaac, the father of Rebecca, in Sir Walter Scott's novel, *Isaac*.

**Isabelle.**—The heroine in Shakespeare's comedy, *Measure for Measure*.

**Island of Lanterns.**—In the celebrated satire of Rabelais, the subject of an old and widely spread legend of the middle ages. Though the island was probably suggested by the *City of Lanterns*, in the Greek romance of Lorian, it has copied this same idea in his *Island of Lapis*.

**Island of St. Brendan.**—A marvelous flying island, the subject of an old and widely spread legend of the middle ages. Though the island of St. Brendan has been a disappointment to voyagers, it has been a favorite theme with poets.

**Island of the Blist.**—Imaginary island in the west. Hither the favorites of the gods were conveyed to live in the bliss of the gods, and ending joy. The name first occurs in *Heard's Works and Days*. This phrase is often used in the same sense.

**Ithuriel.**—In Milton's *Paradise Lost*, an angel commissioned by Gabriel to search through purgatory for the serpent, to find Satan, who had eluded the vigilance of the angelic guard, and effected an entrance into the garden. It is related that Ithuriel found Satan "as he lay, close, dead at the ear of Eve," and transformed him by a touch of his spear into his proper shape.

**Irry Gate of Boreas.**—*Dream*, which depicts a passage through the ivory gate, but those which come true through the horn gate.

**Jack and the Beanstalk.**—A nursery legend said to be an allusion to the Teutonic *Alfader*, the "red hen" representing the all-producing sun, the "monster" being the fermenting rain, and the "harp" the winds.

**Jack-in-the-Box.**—A prominent character in Maypole and Mayday.

**Jack Robinson.**—A famous comic song by Hudson. Jack Robinson, a famous comic song by Hudson.

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**Jessica.**—The beautiful daughter of Shylock, in Shakespeare's *Merchant of Venice*.

**Jesse, Sam.**—The hero of a novel entitled *The History of a Foundling*, represented as a model of generosity, openness, and manly spirit, though thoughtless and childish in his feelings.

**Joyeuse.**—The sword of Charlemagne as mentioned in romances of chivalry.

**Joyeuse Garde, La.**—The residence of the famous Lancelot du Lac.

**Judith.**—The heroine in the book by the same name in the *Apocryphal History*, was a beautiful Jewess of Bethulia, who, when her town was besieged by Holofernes, the general of Nebuchadnezzar, attended him in his tent, where he was drunk, killed him, whereupon her townsmen fell upon the Assyrians and defeated them with great slaughter. The subject is not mentioned by Josephus, and has, from an early period, been held to be an allegory. It has frequently furnished poets and painters with material.

**Kadr, Al.**—The night on which the Koran was sent down to Mohammed. Al hadr is supposed to be the seventh of the twelve nights of Ramadan, of the night between the twenty-third and twenty-fourth days of the month.

**Key.**—A foster brother of King Arthur, and a rude and boastful knight of the Round Table. He was the butt of King Arthur's court. Called also Sir Quous. He is never mentioned by *de la Morte*, in *Perce's Reliques*. Sir Key is represented as the type of rude boastfulness. Sir Gaius of courtesy, Sir Lauchance of chivalry, Sir Mordred of treachery, Sir Gaius of chastity, Sir Mark of cowardice.

**Kekama.**—A Hindoo rajah who obtains and sports with supernatural power. His adventures are related in Southey's poem entitled *The Curse of Kekama*.

**Kent, Earl of.**—A rough, plain-spoken, but faithful nobility in the reign of Henry VIII. He follows the fallen fortunes of the king, disguised as a servant, under the assumed name of Caius. **Kewpie.**—A fairy who is mentioned by *de la Morte*, in *Perce's Reliques*, including a number of little girls who differed from one another only in the length of their curled tresses. The subject of their fancies paginated with bows of blue ribbon.

**Kilkenny Cats.**—Two cats, in an Irish story, which fought till one appeared left but their tails. It is probably a parable of a local contest between Kilkenny and Inishowen, which impoverished each borough.

**Kilmansiegh, Miss.**—An heiress with great expectations and an artificial leg of solid gold, in Hood's poem, *A Golden Leg*.

**King Horn.**—A metrical romance which was very popular in the thirteenth century. King Horn was a beautiful young prince who was driven into piracy; but his life is spared, and after many wonderful adventures he weds a princess, and resumes his father's kingdom.

**King Log and King Skirk.**—Characters in a celebrated fairy tale, which relates that the frog, grown weary of his courtship, petitioned Jupiter for a king. Jupiter accordingly threw down a log among them, which made a satisfactory ruler till the frogs recovered from their fright and discovered his real nature. They, therefore, entreated Jupiter for another king, whereupon he sent them a stick, who immediately began to devour them.

**Klaus, Peter.**—The hero of an old popular tradition of Germany—the prototype of Rip Van Winkle—represented as a goatherd.

**Kuckersbecker, Friedrich.**—The imaginary author of a humorous fictitious *History of New York*, written by Washington Irving.

**Knight of the Swan.**—Lohengrin, son of Parsival, because his boat was drawn by a swan.

**Knights of the Round Table.**—King Arthur's knights were so called because they sat round a round table made by Merlin for King Leodogran. This king gave it to Arthur on his marriage with Guinevere.

**Koppenberg.**—The mountain of Westphalia to which the pied piper (Hunting) led the children, when the people of Hameln refused to pay money for killing their rats. Browning's poem, *The Pied Piper*, tells the tale.

**Kriemhild or Christild.**—The heroine of the *Nibelungenlied* the sister of Günther, king of the Burgundians, and the wife of Siegfried, after his death, marrying Etan, king of Denmark, who was the Gudrun of the *Völsunga Saga* and the *Edda*.

**Lake of the Cat.**—Name given to Lake Erie until the last of the seventeenth century.

**Lake Poets.**—The Wordsworths, Southey, and Coleridge, who lived about the lakes of Cumberland.

**Lampoon.**—A personation of a lampoon. Lampoon, these libels, carried to excess in the reign of Charles II., acquired the name of lampoons from the burden run in them, *My lampoon, my lampoon, my lampoon*.

**Land of Beulah.**—The paradise in which souls wait before the resurrection. *Edgar's Progress* the land from which the pilgrims enter the Celestial City. The name is found in Isaiah lxi. 4.

**Land of Bonadage.**—A name given to the land in the bible.

**Land of Cakes.**—A name sometimes given to Scotland, because oatmeal cakes are a common national article of food, particularly among the poorer classes.

**Land of Nod.**—In common speech sleepy-land or land of dreams.

**Land of Promise.**—The land promised to Abraham—Canaan.

**Land of Shadows.**—A place of unreality, sometimes called the land of shadows.

**Land o' the Leal.**—An unknown land of happiness, loyalty, and virtue. Caroline Oliphant, heroine of *Land o' the Leal*, was in her song and this is now its accepted meaning.

**Land of Wisdom.**—A name given to Normandy, in French history. Normandy was a land of wisdom prevailed there, and also because of the skill and judgment of the people in making laws.

**Land of Youth.**—A name given to the island of Hawaii, in the Pacific Ocean.

**Landlady's Daughter.**—She showed Fleming "over the Rhine-stream, rapid and roaring wide," in *Landlady's Daughter*, the heroine of the novel.

**Last of the Mohicans.**—The Indian chief Uncas is so called by Cooper in his novel of that title.

**Laurel.**—Sir, Stewart of King Arthur, James Russell Lowell has a poem entitled *The Vines of Sir Laurel*.

**Lavaine.**—Son of the lord of Astolat, who accompanied Sir Lancelot when he went to tilt for the ninth diamond. Lavaine is described as young, brave, and a true knight. He was brother to Elinor.

**Lavinia and Palemon.**—Lavinia was the daughter of Acato, patron of Palemon. Through Acato's treachery, Lavinia was sold to a fortune teller, and his friend, Acato lost his property, and dying, left a widow and daughter in poverty. Palemon often sought them, but could not find them. One day, a lovely modest maiden came to glean in the Acato's fields. The young squire was greatly struck with her beauty, and he loved her, but she was known as a pauper and he dared not give her more than a passing glance. Upon inquiry he found that the beautiful maiden was the daughter of Acato; he proposed marriage, and Lavinia was restored to her rightful place.

**Leandro.**—Governor of Messina in Shakespeare's *Much Ado About Nothing*. He prematurely acceded to the proposals made by Don Pedro.

**Leontine.**—In Shakespeare's *Pericles*. Servant to Dionysa. The latter conspired with him to murder his master, and was saved from the crime only by the intervention of pirates.

**Leonor.**—In *Molière's Les Fâmes de Maris*, sister of Leonidas, originally brought up by Acato according to his sentence of training a girl to make him a good wife. He put her on her honor, tried to marry her, and finally, when she refused, he was liberated consistent with propriety and social etiquette, and found that she loved him, and made him a good wife.

**Little John.**—A big, stalwart fellow, named John Little, who encountered Robin Hood, and gave him the name of Robin Hood, and was with him, christened, and Robin stood godfather. Little John is introduced by Sir Walter Scott in *The*

*Scottish Rites*.

**Little Nell.**—*Old Curiosity Shop*, Dickens. The prominent character of the story, pure and true, and a beautiful girl, who was with her, and was christened, and Robin stood godfather. Little John is introduced by Sir Walter Scott in *The*

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stant attendant was Elizabeth, a famous surgeon with whom she roomed in solitary retirement.

**Maiden of Holm.**—An allegorical character mentioned in *Malory's History of King Arthur*. It was taken from a duke by seven knights, and held their king captive. The duke was called Malin, and the knights were called the Maidens' Cattle. These knights made a vow that every maiden who passed the "Athensian maid," and found a lover without a vestige of beauty.

**Maid Marian.**—A half mythical character, but the name is said to have been assumed by Matilda, Maid of the Marshes, who was the daughter of King Hood remained in a state of outlawry. The name is considered the foundation of the word "Maiden" in the name of the "Maiden of Holm."

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**Sur Satyrus (Luther)** rescues Una from bondage; but no sooner is this the case than the fairy is with Archimago, to show how very difficult it was at the time of the Reformation to separate Truth from error.

**Sawyer, Bob.**—*Pickwick Papers*, Dickens. A drinking young fellow who tries to establish a grudge at Brimscombe. The second. Sawyer Weller calls him Mr. Sawbones.

**Scalls, or Scallie.**—Court poets and chroniclers of the ancient Scandinavian. They resorted, and attended the king in all his wars. These bards were employed in court, the gods, the heroes, and national heroes. Few complete Scallie poems have survived, but a multitude of fragments exist.

**Scheherazade.**—*Arabian Nights*. The famed ruler. His reign was a despotism and his decess absolute. **Scheherazade.**—*Arabian Nights*. The famed ruler the stories in these "Entertainments."

**Scaramouch.**—An Italian character whose traits are cowardice and buffoonery. He is of Spanish creation copied into Italian comedy.

**Schlemihl, Peter.**—The name of the hero of a little work by Chamisso, a man who sells his shadow to the devil. The name has become a byword for any poor, silly, and unfortunate fellow.

**Schneider.**—Rip Van Winkle's dog, in Boucicault's dramatization of Irving's *Rip Van Winkle*. The name of the dog in the story is "Wolf."

**Schneider of Göttingen.**—A character. A. P. Stanley says the term was first applied to Attila in the Hungarian *Chronicles*. It is found in a list of names belonging to the twelfth century.

**Sceogee, Ebenezer.**—*Christmas Carol*, Dickens. The prominent character, made partner, executor, and heir of old Scrooge.

**Sebastian.**—(1) Brother of Viola, in *Twelfth Night*. They were twins, and so much alike that they could not be distinguished except by their dress. Sebastian and his sister being shipwrecked, escaped to Illyria. Here Sebastian was mistaken for his sister, and in a moment (in his apparel), and was invited by the countess Olivia to take shelter in her house from a storm.

**Sebastian.**—(2) Brother of Alfonso, king of Naples, in *The Merchant of Venice*. (3) Father of Valentin, in *Le Comte de Beaumont and Fletcher's Mena Thomas*.

**Sedley, Mr.**—*Vanity Fair*, Thackeray. A wealthy London stockbroker. He is a man who is in the money market just prior to the battle of Waterloo.

**Selth.**—One of the two guardian angels of the Duke of York and St. John, the day after the battle of the stock's *Messiah*.

**Sempronius.**—(1) In Shakespeare's *Times of Rome*, a latter of Timon. Timon accuses himself from leading Timon money on the ground that others had been asked first.

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**Shepherd of Salisbury Plain.**—The hero and title of a religious tract by Hannah More. The shepherd is noted for his homely wisdom and simple life.

**Shakespeare.**—Pan, in Greek mythology, was the god of forests, pastures, and flocks, and the reputed inventor of the shepherd's staff or pipe.

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**Stenter.**—A Grecian herald in the Trojan War, whom Homer describes as great-braved. Brave-voiced Stenter, accustomed to shout as loud as fifty other men.

**Stephane.**—In Tasso's *Jerusalem Delivered*, Earl of Carnuti, the leader of 400 men in the allied Christian army. He was noted for his military prowess and was killed by the beautiful Isabella in Shakespeare's *The Tempest*; (3) servant to Portia in Shakespeare's *Merchant of Venice*.

**Stiggle.**—A name of a character in the "hypocritical" shepherd, or Methodist parson, in Dickens' *Pickwick Papers*, with a great appetite for pinesapples.

**Strophon.**—The shepherd in Sir Philip Sidney's *Arcadia*, who was killed by the beautiful Isabella. It is a stock name for a lover, Chloë being usually the corresponding lady.

**Strongheart.**—One of the seven attendants of Fortunio, in D'Aulnoy's *Fairy Tales*. He could never be over-weighted, and could fell a forest in a few hours without fatigue.

**Summer, St. Martin's.**—The fine weather which generally occurs in October and November; referred to in *Henry VI.*

**Tahard.**—The inn, in High Street, South-west London, from which Chaucer makes his pilgrims start on their journey to Canterbury. It took its name from its sign—a tahard.

**Tantalus.**—The name of a character in the legend, was the greatest of all the Christian warriors, except Rinaldo.

**Tartarus.**—The name of the chief character in Molière's most celebrated comedy, *Le Tartuffe*, which has become a synonym in all languages for hypocrisy.

**Tessie, Lady.**—The heroine of Sheridan's comedy, *The School for Scandal*, and the wife of Sir Peter Teazle.

**Tessie, Mr. Peter.**—A character in Sheridan's play *The School for Scandal*, husband of Lady Teazle.

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diction. Castor was famous for his skill in managing horses, and Pollux for his boxing.

**Cauter.**—In Mohammedan mythology the lake of paradise, whose waters are as sweet as honey, as cold as snow, and as clear as crystal, and any believer who tastes thereof is said to thirst no more.

**Cerberus.**—In mythology is represented with upper and lower jaws, the lower part of which is a dragon. Cerberus is said to have founded Athens, and to have divided Asia into twelve constituent states, and to have introduced the elements of civilized life; he instituted marriage, abolished bloody sacrifices, and taught his subjects how to worship the gods.

**Centaurs.**—Monsters, half horse, half human. They are supposed to dwell in the mountains of the Lapiths in the mountains of Thessaly.

**Cephalus.**—Husband of Procris, loved by Eos, who advised him, when he rejected her advances, to try his wife's fidelity. Cephalus himself as a lover, he returned to Procris, but she received his advances with disdain. He made himself known, loaded her with reproaches, and left her in a rage. Procris then fled to Crete, where Artemis gave her a dog and an unerring spear and sent her back. To obtain the dog and spear, Cephalus pretended to love her, and a reconciliation followed. He killed her accidentally with the spear.

**Cerberus.**—The guardian of hell, who keeps the entrance of the infernal regions. He prevents the living from entering and the shades from leaving. Cerberus is represented as a dragon with his lyre; and the sibyl who conducted Aeneas through the inferno, also threw the dog into it.

**Ceres.**—The daughter of Saturn, sister of Jupiter and Neptune. She was the goddess of corn, wheat, and harvest. She represented as riding in a chariot drawn by dragons, and crowned with poppies. She was the mother of Proserpine, who was seized by Pluto and shut her hair in corn flowers. Ceres was the Roman name for mother-earth.

**Chaos.**—The vacant space which existed before the creation of the world, and out of which the gods, men, and the animals of Chaos were called the brother of Erebus and Night.

**Charon.**—A god of the infernal regions, son of Noa and Erebus, who conducted the souls of the dead in a boat over the river Styx and Acheron.

**Charibdis.**—A woman who robbed travelers of their goods, and turned by a whirlwind into a monster on the coast of Sicily, opposite Scylla. Scylla and Charibdis are generally mentioned together to represent alternative dangers.

**Chilobabos.**—A musician, ruler in the land of spirits, and friend of Iambus. Personification of harmony in nature.

**Chimæra.**—A celebrated monster, griff, lion, and dragon, which continually vomited flames. It was destroyed by Bellerophon.

**Chiron.**—A centaur, son of Phylira and Saturn. He was famous for his knowledge of medicine, and is thought to have been the teacher of Achilles. He was placed among the stars, and is known as Capricornus.

**Chloris.**—The goddess of flowers, known as Flora in Greek mythology.

**Chou.**—An Egyptian god corresponding to the Roman Hercules.

**Cimmerians.**—People living in a land of perpetual darkness.

**Circæ.**—A sorceress, daughter of Sol and Persæa, celebrated for her knowledge of magic and venomous herbs. Ulysses, on his return from the Trojan war, visited her coast, and his companions were changed by her potions into swine.

**Clio.**—The muse who presided over history.

**Clotho.**—The youngest of the Fates, three daughters of Jupiter and Themis, supposed to preside over the moment of birth. She held the distaff.

**Cluturnus.**—An Irish elf, who guards a hidden treasure. He has an evil disposition, and appears in a wrinkled mask.

**Clytemnestra.**—Daughter of Tyndarus and Leda, sister of Castor, Pollux, and Helena; wife of Agamemnon; and mother of Orestes, Iphigenia, and Electra. During her husband's absence at Troy she lived in adultery with Agamemnon, and after his return she murdered him with the help of Agamemnon. He was subsequently put to death by her son Orestes, to revenge the murder of his father.

**Clytie.**—A water-nymph who loved the sun-god, Apollo, and was changed into a sunflower. In this god, she turns her eyes and her face.

**Cocytus.**—A river of the infernal regions. The unburied dead wander on its banks for 100 years, until it is known the rivers of torment have been crossed.

**Cochis.**—A country of Asia famous for the expedition of the Argonauts, and the birthplace of Bellerophon.

**Concordia.**—The goddess of peace and concord, one of the oldest at Rome. She is represented holding a scepter budding with fruit, and a horn of plenty. Camillus raised a temple to this goddess in the capital.

**Consentes Dei.**—The twelve European gods who assist the council of Jupiter, consisting of six male and six female divinities—Jupiter, Neptune, Mercury, Apollo, Mars and Venus; Juno, Ceres,

Cupidus, or Cupidus. A mythical king of Africa, of great wealth, who led a life with a black-girl, and married her. Her name was Penelopion, but Shakespeare writes it Zennobion, and the story is told in his comedy of the Two Gentlemen of Verona.

**Corvæ.**—Priests who served at the worship of the mother of the gods. The name came from their habit of striking themselves in their religious dances.

**Croesus.**—Daughter of Calchus the Greek, beloved by Trosius, son of Priam. They vowed eternal fidelity, and as pledges Trosius gave her a golden robe, and Croesus gave the Trojan prince a glove.

**Croesus.**—Daughter of Priam, and wife of Aeneas. She fled to the city of Troy when her husband escaped from his flames.

**Cronos.**—The youngest of the Titans. Cronos was the father of Jupiter.

**Cupid.**—God of love, son of Jupiter and Venus, represented as a winged boy, naked, armed with a bow and arrows, and often with a bandage covering his eyes. He shot his arrows into the hearts of both gods and men. Like all the gods, he put on different forms to suit his plans. He became the husband of Psyche.

**Cybele.**—A goddess, daughter of Coelus and Terra, and wife of Saturn. On her birth she was mountain, and at last she was unclothed and led by wild beasts, receiving the name of Cybele from the mountain.

**Cyclops.**—One-eyed giants who forged the thunderbolts of Jove. Homer describes them as wild, insatiable, and unbridled in their passions.

**Cyparissus.**—A beautiful youth, beloved by Apollo, whose favorite stag he inadvertently killed, and who was metamorphosed into a cypress because of his grief.

**Cytherea.**—A name given to Venus from the island of the sea.

**Dag.**—In mythology of the north this name is given to the god of night. The name is also applied to the last of a treacherous race, the Hundingas.

**Dagon.**—A national god of the Philistines, formed in human shape upward from the waist, and resembling a fish downward, with a finny tail.

**Dagobert.**—A king of the Franks, who was constructed the world when it had been destroyed after creation.

**Dæmonology.**—The mythology of Persia the ages of the world are divided into periods of 1,000 years. When the cycle is complete, the reign of Ormusd begins, and men and men will be happy. This event will be preceded by the looting of Dahak, who will break his chain and fall upon the heads of men, and bring on man the most dreadful calamities.

**Dakka.**—A mythical god invoked by Japanese workers. He is represented as holding a full sack, and is said to bring from it all useful articles, and the sack never becomes empty.

**Dakka.**—Among Hindu gods these are powerful to work evil.

**Danaë.**—The daughter of Acrisius, king of Argos, who became the mother of Perseus. An Italian legend related that Danaë came to Italy, built the town of Ardea, and married Plautus, by whom she became the mother of Daunus, the ancestor of Turnus.

**Danaides.**—The fifty daughters of Danaus, king of Argos, who married the fifty sons of their uncle Egyptus.

**Daphne.**—A nymph, daughter of Peneios. Apollo courted her, but she fled from him, and was, at her own request, turned into a laurel tree.

**Daphnia.**—A Sicilian shepherd, son of Hermes (Mercury), by a nymph, was taught by Pan to compose the pæan, and was regarded as the author of bucolic poetry. A maid to whom he proved faithless punished him with blindness, whereupon Pan, in revenge, translated him to heaven.

**Delphobus.**—A son of Priam and Hebe, and, next to Hector, the bravest among the Trojans.

**Demeter.**—The goddess of Paris, he married Hebe which was betrayed by her to Menelaus, by whom he was slain and fearfully mangled on the capture of Troy.

**Delius.**—A name of Apollo, from Delos, the island in which he was born. The name Delia, of his first wife, Hera, was the same.

**Delphi.**—A town on Mount Parnassus, famous for the oracle and the temple of Apollo. Over the hill of Delphi, Hera was pierced the tripod on which sat the priestess through whose mouth he was thought to reveal the future.

**Demeter.**—The goddess of Ceres, whom she was evidently a goddess of the earth, whom some ancient system married to Zeus, the god of the heavens.

**Demogorgon.**—The genius of the soil or earth, the god of support of plants. He was depicted as an old man, bearded with moss, and was said to live underground.

**Demogorgon.**—A son of Prometheus, who, according to the legend, was, with his wife Pyrrha, the sole survivor of the Thesalian deluge.

**Demogorgon.**—An Italian deity, whom the Romans identified with the Greek Arcturus. At

Rome Diana was the goddess of light. She was a daughter of Jupiter, and was born of Leto, at Leto, on the island Delos, at the same time with Apollo. As in Apollo the sun was deified and as Diana was the goddess of the moon, she was

**Diade.**—Daughter of Belus, king of Tyre. She was married to Bithynus, who was murdered for the sake of his wife by Pygmalion. Diade then fled with some followers and founded Carthage.

**Diade.**—A neighboring king, Harbas, sought her hand in marriage, and she refused him. He then seized her, and she stabbed herself. Vergil, in the *Æneid*, makes Aeneas visit her, and her death the cause of the destruction of Tyre.

**Diade.**—A Greek hero of the Trojan war, a son of Iphidamas, and a king of Argos. He was a favorite of Athena, who was his patroness. He encouraged him to attack and wound both Mars and Venus, who were engaged on the side of the Trojans.

**Diade.**—The daughter of the goddess of the moon, she fed her mares on the flesh of his guests, was overcome by Hercules, and was given to the same horses as food.

**Diade.**—The youngest of the Titan sisters and reputed mother of Venus. The name has also been poetical applied to Venus herself.

**Dionysus (Bacchus).**—Son of Jupiter and Semele, the daughter of Cadmus. He was the god of wine, and is generally represented crowned with vine leaves.

**Dionysus.**—The avenging goddess, or Furies.

**Dionysus.**—The goddess of the moon, and hence also to the lower world.

**Discordia.**—A malignant deity corresponding with the Greek goddess of discord. She was driven from heaven by Jupiter because she sowed dissensions among the gods. At the suppers of Peleus and Thetis she threw an apple among the gods, which was the primary cause of the ruin of Troy, and of infinite misfortunes to the Greeks.

**Dises.**—Demons of Persian mythology. According to the Koran, they are ferocious and gigantic spirits who rule the sovereignty of hell.

**Dises.**—The most ancient oracle was that of the Delphic Oracle, which was the Oracle of the Mole, said to have been built by Democritus.

**Dises.**—A name given, sometimes, to Thor, the thunder-god in Norse mythology.

**Doris.**—Daughter of Oceanus and Thetis, wife of Nereus, and mother of the Nereides.

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before the present world, and separated the region of fog from the region of heat. Giants were the first beings who took life among the imbergs that filled this vast aby.

**Gladheim.**—The palace of Odin, in which were the great hall and the place where the gods and the twelve asen occupied by the gods when holding council.

**Gladir.**—A marvelous grove in Asgard, in which the leaves were of all shimmering red gold.

**Gleiderer.**—In Hindu mythology is a kind of wyph, the most lovely of the gods.

**Gnome.**—One of a class of spirits or imaginary beings which were supposed to tenant the interior parts of the earth, and in which the dwarfs and gnomes, etc., were cited. Rubezahl, of the German legends, is often left as a representative of the class.

**Goblins and Bogies.**—Familiar demons of popular superstition, a spirit which lurks about houses. It is also called loggibog. Goblins are used in a serious sense by Shakespeare in *Hamlet*, where the ghost is supposed to be a "spirit of health or goblin damned."

**Golden Apples.** The.—The golden apples in the gardens of the Hesperides were a great treasure which was thought to be altogether unobtainable. The gardens were watched by a monstrous dragon, and to bring the golden fruit to Eurystheus was one of the tasks imposed upon Heracles.

**Golden Fleeces.**—In Greek mythology, the husband of Medea, the son Phryxus, the husband of a ramine which died on the land, and he ordered him to be sacrificed to the angry gods. Phryxus made his escape over sea on a "ram" which had a golden fleece. When he reached Colchis he sacrificed the ram to Zeus, and gave the fleece to King Aetes, who was his uncle. It was afterward stolen by Jason in his celebrated Argonautic expedition.

**Graces.** The.—Three sisters, with heads covered with serpents. Two of them, Steno and Euryale, were immortal, while Medusa was mortal. Originally a beautiful maiden, she was changed into a gorgon by Athena for profaning her temple, and her appearance was so terrible that those who gazed upon her were impaled upon a stake. She was killed by Perseus, and Athena placed her head in the center of her shield.

**Graces.**—To the retinue of Venus belonged the Graces, servants and companions of the goddess. They were said to be daughters of Jupiter and Eurymome, or, according to other authorities, of Venus herself, and were three in number—Splenor, Pleasure, and Joy. They were honored, especially in Greece, and were worshipped in special cities. Altars were often erected to them in the temples of other gods, especially in those of Mercury, Venus, and Bacchus.

**Grim.**—Wife of Odin and mother of Vidar. She lent her garb, staff, and glove, warning him to beware of the serpent Fenrir.

**Gripri.**—A horse-trainer, servant of Odin, who could foretell events of the future. He could teach a young hero all the secrets of the world. He is compared to Chiron the Centaur.

**Hades or Pluto.**—Brother of Zeus and Poseidon, obtained the kingdom of the lower world in the division of the world among the three brothers, and his name was often used as synonymous with the abode of the shades. He carried off and married Persephone, or Proserpine.

**Hamadryades.**—Nymphs, each of whom was born and died with the tree in which she lived.

**Harmenia.**—A daughter of Menelaus and Helen. She was privately promised in marriage to Orestes, the son of Aegamemnon; but her father, ignorant of the engagement, gave her hand to Pyrrhus, the son of Achilles, whose services in the Trojan war he had valued.

**Harpies.**—Winged monsters who had the face of a woman, the body of a bird, and the claws of numbers armed with claws. They were three in number—Alto, Ocyete, and Celeno—and were daughters of Pontus and Erichonius.

**Hebe.**—Daughter of Zeus and Hera. She served as cupbearer to the gods until Hercules was received among them, when she was given to him in marriage.

**Hecate.**—A mysterious threefold goddess, daughter of Peres and Asteria. She presided over the dead and the living, and was worshipped on earth, and Proserpine in the lower world.

**Hector.**—Son of Priam and Hecuba, the bravest of the Trojan heroes. He married Andromache. Upon his killing Patroclus, friend of Achilles, the latter was reduced to vengeance. He pursued Hector and slew him, and then dragged his body at his chariot wheels into the camp of the Greeks.

**Hecuba.**—Daughter either of Phrygia or of Cyprius king of Thrace, wife of Priam. She was carried away as a slave by the Greeks, and was either transformed into a dog or threw herself into the sea.

**Heimdall.**—In northern tales a god who lived in the celestial city Himinbjerg, and used the extremity of the bridge Bifrost, and kept the keys of heaven. He is the watchman or sentinel of Asgard, sees even when he can hear the grass grow, and even the wool on a lamb's back. Heimdall, at the end of the world, will wake the gods with his trumpet.

**Hecuba.**—Daughter of Zeus and Leda, the most beautiful woman of Greece. In her youth she

was carried off by Theseus, but was rescued by her brothers Castor and Pollux. She married Themistocles and was married to him by Paris. The Greek chiefs who had been her suitors resolved to take vengeance, and accordingly she was sacrificed. From her ashes Paris she married his brother Deiphobus. When Troy was captured Helena betrayed Iphigeneus her two children, who made away through the air with whom she lived until his death. The accounts of her death differ.

**Hellas.**—The land of mountains in Boeotia, sacred to Apollo and the Muses, from which sprang the fountains of the Muses—Aganippe and Hippocrene.

**Hellas.**—The god of the sun, called Sol by the Romans.

**Hellas.**—The daughter of Athamas and Nephele and sister of Phryxus. When his stepmother Ino was about to sacrifice Phryxus to Zeus, Nephele rescued her two children, who made away through the air on a ram with the golden fleece, which Hermes gave. Between Egeus and the Cerebusian. Helles fell into the sea, which received the name of Hellespont in consequence.

**Hellas.**—Son of Deucalion and Pyrrha, mythical ancestor of the Greeks.

**Hell Shoon.**—In Icelandic mythology indispensable for the journey to Valhalla as the obolus for the ferryman.

**Helmet of Hades.**—A helmet borrowed from Pluto and worn by Perseus, rendering him invulnerable. It was lent him by Hermes, the god of commerce, wings, winged shoes, and a short sword.

**Hellas.**—The Greek name for the hero Jupiter, known among the Romans as Juno. His wife was Minerva, who placed it in the hands of her shield.

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veiled in darkness. Their names were *Hades*, *Erebyth*, and *Arcthus*; and they were appointed to rule the golden age, which were the gift of Earth to Juno on her wedding day. The celebrated gardens of the Hesperides abounded with fruit, and were carefully guarded by a dragon which never slept.

**Hesperus.**—A supposed son or brother of Atlas and Procrustes, who was killed by his death, and made identical with the evening star.

**Hestia.**—The Greek name for *Vesta*. She was the goddess of the hearth.

**Hippocrene.**—A fountain of the Muses, on Mount Helicon, in which they bathed. "The whole world was celebrated for its fresh fountains and cool groves, and flowery slopes"; and the legends of the locality, as if in sympathy with its natural beauty, were full of legends, which characterized those of other mountains more wild and rugged.

**Hippolyte.**—A queen of the Amazons, given in marriage to Theseus by Hercules. Hippolyte was their son.

**Hippolyte.**—Son of Theseus and Hippolyte. His stepmother, Phaedra, fell in love with him. He fled to the washers, where, his horses taking flight and rushing among the rocks, his chariot was broken into pieces, and he was killed. According to some accounts, he was restored to life by Asclepius.

**Hippomenes.**—Son of Megareus, and great-grandson of Poseidon (Neptune). He conquered Ascalaphus, the foot-baller, by using three golden apples, one of which he stopped to pick up.

**Hippomenes.**—An avil spirit known among American Indians.

**Hippomenes.**—A famous German kobold, or domestic fairy servant; so called from wearing a little felt hat pulled down over his face.

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**Palladium.**—A sacred image of Athena, which was supposed to keep safe the city in which it was preserved. Zeus threatened to destroy it as Hera was beginning to build Troy, and Ilus built a sanctuary for it. Ulysses and Diomedes carried it away.

**Pallas.**—A name of Minerva. She is said to have received the name because she killed a giant named Pallas during that name.

**Pan.**—The god of shepherds, huntsmen, and the inhabitants of the country. He was in appearance a monster; he had two small horns on his head, and his legs, thighs, tail, and feet were like those of the goat. He was the inventor of the syrinx or shepherd's flute. Sudden fright without visible cause, a panic, was ascribed to Pan. The Romans identified Panus with him.

**Panarus.**—A son of Lyones, who aided the Trojans in their war with the Greeks. He broke the three which had been made between the contending armies, and wounded Neleus and Diomedes. He was at last killed by Diomedes.

**Pandion.**—King of Athens, father of Proene and Philomela, in whose reign Bacchus and Demeter are said to have come to Attica.

**Pandora.**—The first woman on earth. When Prometheus stole fire from heaven Zeus bade Hephestus to make a woman from earth. Aphrodite gave her beauty, Hermes boldness and cunning, and each god gave some gift. Hermes took her to Epimetheus, who married her. In his house she was a jar which contained all the evils of Pandora was tempted by curiosity to open the lid, when all the evils inside into humanity poured out, and she had no time to shut the lid, preventing the escape of Hope.

**Panthemon.**—A celebrated temple at Rome, built by Appius in the reign of Augustus and dedicated to all the gods.

**Parce.**—The Fates, powerful goddesses who presided over the thread of life. There were three in number, Clotho, Lachesis, and Atropos, daughters of Nox and Erebus, according to Hesiod, or, according to what he says in visible place, of Jupiter and Themis.

**Paris.**—In Greek mythology, the second son of Priam, king of Troy. He was called Paris because he dreamed before his birth that he had brought forth a firebrand, which was interpreted to mean that he would cause the destruction of Troy. To prevent this the child was exposed on Mount Ida, where he was discovered by a shepherd, who brought him up as his own son. He was brave and courageous, and was loved by the gods. He was a nymph of Ides, who he married. At the marriage of Peleus and Thetis a dispute arose whether Here, Athena, or Aphrodite was the most beautiful, and as each entitled to the golden apple, Paris was chosen judge. He decided in favor of Aphrodite, who had promised him the fairest woman in the world for his wife. Subsequently he was killed by Hector. He married Helen, who had married Menelaus (or Helen), the fairest woman of the same name, and he was killed with him. This led to the siege of Troy, at the capture of which he was killed by an arrow.

**Parthenos or Parnassos.**—A mountain near Delphi, in Greece. It contained numerous caves, grottoes, and romantic ravines. It has two summits, one of which was consecrated to Apollo and the Muses, the other to Bacchus. It was anciently called Parnassos, from Iarnas, an ark, because Deucalion's ark stranded there after the flood. It was the oracle of Delphi was built at its foot it received the name of Parnassos. It is celebrated as one of the chief seats of Apollo and the Muses, and an inspiring source of poetry and song.

**Parthenope.**—One of the sirens, whose dead body was washed ashore on the present site of Naples. She threw herself into the sea out of love for Ulysses.

**Patroclus.**—The gentle and amiable friend of Achilles in Homer's *Iliad*.

**Patuk.**—Name given to the great power, death, in American Indian mythology.

**Pau-Puk-Keewis.**—In American Indian folklore a mischievous magician, who is pursued by Hiawatha, goes through a series of transformations in his endeavors to escape, and finally becomes an eagle.

**Pax.**—The goddess of peace, worshipped in Greece under the name Irene. Pax wears a crown of laurel, and holds in her hand the branch of an olive tree.

**Pebson.**—In American Indian folklore the personification of winter in form of a great giant who shook the snow from his hair, turning it into stone by his breath.

**Pegaseus.**—The winged horse which sprung from the blood of Medusa when she was slain by Perseus and was used by Zeus to carry thunder and lightning. He was also the horse of the Muses.

**Peleus.**—King of the Myrmidons at Phthia in Achaia. He was in conjunction with his brother Telamon murdered his half-brother Thersites, he was expelled by Aeneas from Agina and went to Phocia. He was killed by the murder by Eurymachon who gave Peleus his daughter Antigone in marriage, and a third part of his kingdom.

**Pelias.**—The name of the spear of Achilles, which was so large that none could wield it but the hero himself.

**Pelion.**—A high mountain in Thessaly celebrated in mythology. Near its summit was the cave of the Centaurs. The Centaurs, who lived with the gods, are said to have attempted to keep Oene and Olympus on Pelion, or Pelion and Oene on Pelion, in order to make the mountain the timber was felled with which the ship Argos was built.

**Pelopides.**—Son of Tantalus and Dione, husband of Hippodamia, king of Pisa in Elis; from him the southern peninsula of Greece, or the Peloponnese, derives its name. His father had seduced his wife, and he was killed by his father, and his mother was banished to a banquet, and killed Pelopides and served him; they refused to taste the dish, and he was treated to a banquet in order to make him believe the timber was felled with which the ship Argos was built.

**Pelopides.**—The household gods of the Romans, in Latin, *Penates*, were the gods of the household.

**Penelope.**—The faithful wife of Ulysses, who being importuned, during his long absence, by numerous suitors for her hand, postponed making a decision among them until she should have finished weaving a funeral pall for her father-in-law, Laertes. Every night she secretly unraveled what she had woven by day, and thus put off the suitors till Ulysses returned.

**Perceus.**—Favie are delicate, graceful, fairy-like beings of eastern mythology, begotten by fallen spirits. They direct with a wand the pure in mind the way to heaven. These lovely creatures, according to the Koran, are under the sovereignty of Eblis, and Mohammed was sent for their conversion.

**Peres or Peresela.**—A daughter of Oceanus, and wife of Helios (the sun), by whom she became the mother of the sun-god, and the goddess of the sun.

**Persele.**—A name given to Hecate, as the daughter of Peres by Asteria.

**Perseus.**—The Greek name of Proserpine. Homer describes her as the wife of Hades (Pluto), and the formidable, venerable, and majestic queen of the underworld.

**Perseus.**—A name given to the god of the underworld, who was born in the boat in which they were set adrift when Perseus was born, treated them kindly, but in the end he was killed by the Gorgon Medusa.

**Perseus.**—A daughter of Minos and Pasipha, who obtained the wisdom and the magic wand, and went to Attica, where he discovered and saved Andromeda. He afterward returned to Argos, and was killed by his brother, who was his grandfather, by hitting him with a quail.

**Phedra.**—A daughter of Minos and Pasipha, who obtained the wisdom and the magic wand, and went to Attica, where he discovered and saved Andromeda. He afterward returned to Argos, and was killed by his brother, who was his grandfather, by hitting him with a quail.

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sequence of the intrigues of his stepmother Ino. Nephele rescued her children, who rode away on a ram with the golden fleece, and fell in love in Colchia, married Chalciope, daughter of Aetes, and sacrificed the ram to Zeus.

**Phyllis.**—The daughter of Rhiparus, according to some authorities, of Lycurgus, king of Thrace. She rescued Demophoon, who landed on her coast on his return from the Trojan war, and fell in love with him, and he reciprocated her affection; but afterward proving faithless, Phyllis hanged herself, and her body was thrown into the sea, and was blown into an almond tree.

**Phylax.**—King of Latium, son of Saturn, who married Venus. He was hunting he was met by Circe, who became enamored with him. She changed him into a woodpecker.

**Phylax.**—The name given to the Muses, because they were born in Phylax, or, as some say, because they were supposed to be daughters of Phylax, a king of Macedonia, who settled in Boeotia.

**Phryne.**—A celebrated fountain at Corinth, at which Bellerophon is said to have caught the horse Pegasus. It gushed forth from the rock in the Acrocorinthus, was conveyed down the hill by subterranean conduits, and fell into a marble basin, from which the greater part of the town was supplied with water. The poets frequently used Phryne in the general sense of Corinthian.

**Phleas.**—Means the "sailing stars," because the Greeks considered navigation safe at the return of the stars. The Phleas were the seven daughters of Atlas and Pleione, named Electra, Alcyon, Sthenelox, Arcturus, Loxos, and Merop. They were transformed into stars, one of which (Merop) is invisible, out of shame because she was the only one who refused to call the invisible star "Electra," and say she hides herself from grief for the destruction of the city.

**Phlo.**—He was a second brother of Jupiter, and received, as his portion in the division of empire, the inferior regions of the world of shades. The chief incident in the history of Pluto is his seizure and abduction of Proserpine, who thereby became his wife and the queen of the lower world.

**Phlo.**—The god of riches; was probably of allegorical rather than mythical origin, since his name is Greek, and not Latin. He was the god of riches, and the queen of the lower world.

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## SCIENCE

### OF THE SCIENCES—SCIENCE (Latin, *Scientia*, that which we know) is human experience, tested and refined, and differs from creed (that which one believes), resting on bases other than human experience; it differs from philosophy (our generalization as to that which transcends or lies beyond human experience); it differs from mere fact or record not set in order; it differs from history in dealing properly with causes and effects shown in proper relations. It differs also from art, which is essentially action based on human knowledge. In common language, however, the art and the science on which it rests may often receive the same name, as in the case of agriculture, which word implies a science,

or group of sciences, relating to the rearing of crops, and also the use of this classified knowledge or science in actual practice.

In the language of modern Europe, the names of most of the sciences are derived from Greek roots, the second element in each being *lógos*, *logos*, a discourse. Thus osteology (*osteeos*, *osteon*, bone) is a discourse on bones; ornithology (*ornis*, *ornis*, bird) a discourse on birds. More exactly we may say that osteology is the science of bones. Again as each science is to the individual man an object of study, osteology becomes pedagogically the study of bones. By the addition of *lógos* to a Greek root, an indefinite number of additional words can be framed, and will be framed in the future as the need

for expression shall arise. For example, we may have rhodology, the science or the study of roses; orchidology, the science or the study of orchids; cynology, the science or study of dogs.

Other names applied to sciences conventionally terminate in the termination *ics*, which forms in many cases a euphonic ending. Thus optics, the science of vision (*opsis*, *ops*, eye); ceramics (*keramos*, *ceramos*, a pitcher), the science of pottery. Other words of this sort might be readily devised, as cynics, the science of dogs; rhodics, the study of roses. Still other terms end in English in *graphy* (*graphein*, to write), indicating that the science is accompanied by writings or drawings: as geography, description of the earth, as distinguished from geology, the study or science of the earth (*gē*, *ga*, earth). Still other recognised names of science spring from various roots, mainly from the Greek.

Beginning with inorganic nature, we may make the following classification of those branches of science which have recognised names in the English language.

### SCIENCES OR STUDIES OF INORGANIC NATURE

#### Concerning the Heavens

**ASTRONOMY:** science or study of the stars.  
**Cosmology:** science of the universe.  
**Uranography:** science (mapping) of the heavens.  
**ANEMOLOGY:** science of winds.  
**Climatology:** science of climates.  
**Crystallography:** science of crystals.  
**Epidemic Geology:** science of forces molding earth from without.  
**Geodasy:** science of the earth's surface.  
**Geognosy:** science of the earth's peculiarities.  
**Geography:** science (mapping) of the earth's surface.  
**Geology:** science of the earth.  
**Hydrography:** science of river basins.  
**Hypogeal Geology:** (Plutonics) science of forces molding earth from within.  
**Lithology:** science of stones.  
**Metallography:** science of metals.  
**Metalurgy:** science (and art) of metals and ores.  
**Meteorology:** science of weather phenomena.  
**Mineralogy:** science of minerals.  
**Oceanography:** science of the ocean basins.  
**Oreography:** science of mountains.  
**Petrography:** science of rock composition.  
**Phytography:** science of the physical features on the earth's surface (also called physical geography).  
**Seismography:** science of recording earth tremors.  
**Seismology:** science of earthquakes.  
**Stratigraphy:** science of rock strata.  
**Topography:** science of the modifications of land surfaces.

#### Concerning the Earth

**PERVANCE:** the science of mass and force.  
**Dynamics:** science of force.  
**Mechanics:** science of application of force.  
**Thermodynamics:** science of force as related to heat.  
**Acoustics:** science of sound and hearing.  
**Astrophysics:** the science of physical features of the stars.  
**Caloric:** science of heat, as a mode of motion.  
**Electricity:** the science of the mode of motion known as electric currents.  
**Galvanism:** the science of galvanic electricity.  
**Geophysics:** science of physical features of the earth.  
**Hydraulics:** science of moving water.  
**Hydrodynamics:** science of the relation of liquids and power.  
**Hydromechanics:** science of power derived from motion of water.  
**Hydrostatics:** science of pressure of water at rest.  
**Magnetism:** the science of magnetic electricity.  
**Optics:** science of light and vision.  
**Pneumatics:** science of relations of gases to force or power.

#### Concerning Mass and Force

**CHEMISTRY:** the science of the intimate composition of matter.  
**Alchemy:** science (and art) of the alleged transformation of baser metals into gold.  
**Biochemistry:** the science of the chemistry of living beings.  
**Inorganic Chemistry:** science of elements and compounds not produced by the process of life.  
**Organic Chemistry:** science of the chemical compounds produced by the processes of life.  
**Physical Chemistry:** science of the features of matter involving both physics and chemistry.  
**Physiological Chemistry:** science of chemical changes within the bodies of animals.  
**Spectroscopy:** science (and art) of relation of chemical substances in the stars or on earth to the light spectrum.

#### Concerning the Molecules and Lesser Divisions of Matter

**BIOLOGY:** science of life and of living organisms (animals and plants).

**Analogy:** the science or study of chance relationship.  
**Anatomy:** science of the structure of living organisms.  
**Bioomics:** science of changes in form of living organisms due to life adjustment and to other causes, from generation to generation.

**Comparative Anatomy:** science of the relation of forms in organs of living beings.

**Cytology:** science of the structure and functions of the organic cells forming tissues in living beings.  
**Dietetics:** science of food stuffs in relation to digestion.

**Ecology:** science of the adjustment or behavior toward environment of living organisms (used chiefly in reference to plants).

**Embryology:** science of the development of the fertilised germ-cell through different stages; the science of embryo.

**Environment:** science of the effects of the results of external conditions in the development of individuals or species.\*

**Heredity:** science of continuity of type, from generation to generation (the name also applied to the law or fact of such continuity).\*

**Histology:** science of the tissues of which organs are formed.

**Homology:** the science of underlying resemblances in man or lower organisms, the supposed impress of common heredity.

**Hygiene:** science of the methods of maintaining health; (is used chiefly in reference to man).

**Isolation:** science of the results of the separation of individuals from the mass of the species.\*

**Morphology:** science of forms in organs of living organisms.

**Ontology:** science of the life history of the individual.

**Organic Evolution:** science of orderly change in life forms from generation to generation; (the name more often applied to the fact or process than to the science).

**Pathology:** science of diseases in men or other organisms.

**Phylogeny:** science of the history or development of the species or type.

**Physiology:** science of the functions of the organs of living beings.

**Sanitation:** science of the processes of maintaining health.

**Selection:** science of the results of the survival of one class of individuals as compared with others, from generation to generation.\*

**Taxonomy:** science of the orderly arrangement of living beings according to their structure or according to their supposed origin or development. Classification is the general name for the processes of taxonomy.

**Teleology:** science of real or supposed purpose or adaptation in structures of men or lower organisms.

**Teratology:** science of monstrosities and their causes among men or other organisms.

**Variation:** science of individuality and the tendencies to divergence from generation to generation.\*

\* The terms Environment, Heredity, Isolation, Selection and Variation are used more generally in the sense of factors in organic evolution of species or types.

## SCIENCES OR STUDIES OF INORGANIC NATURE—Continued

## Sciences Chiefly or Wholly Related to Plants

**BOTANY:** science of plants.  
**Abiogenesis:** science of (alleged) spontaneous generation of organisms.  
**Agriculture:** science (and art) of cultivation of the fields.  
**Agrostology:** science of grasses.  
**Algology:** science of seaweeds.  
**Arboriculture:** science (and art) of tree culture.  
**Bacteriology:** science of bacteria and microbes.  
**Bryology:** science of mosses.  
**Dendrology:** science of trees.  
**Diatomology:** science of diatoms, minute one-celled plants.  
**Forestry:** science (and art) of care and culture of forests.  
**Fungology:** science of fungi (toadstools, molds, etc.).  
**Horticulture:** science (and art) of plant culture.  
**Lichenology:** science of lichens.  
**Limnology:** science of swamp-land.  
**Paleobotany:** science of extinct vegetation.  
**Phytogeography:** science of the geographical distribution of plants.  
**Pteridology:** science of ferns.  
**Xerophytology:** science of desert vegetation.

**ZOOLOGY:** science of animals.

**Andrology:** science of male organisms as such.  
**Animal Psychology:** science of nervous impulses and nervous reflexes.  
**Cardiology:** science of crustaceans (crabs, lobsters).  
**Conchology:** science of shells.  
**Cranology:** science of skulls.  
**Dermatology:** science of the skin and its functions.  
**Entomology:** science of insects.  
**Gastrology:** science of the stomach.  
**Gynaecology:** science of female organisms as such.  
**Hemintology:** science of worms.  
**Herpetology:** science of reptiles.  
**Ichthyology:** science of fishes.  
**Laryngology:** science of the throat and its functions.  
**Mammalogy:** science of mammals.  
**Myology:** science of muscles.  
**Neurology:** science (anatomy, physiology, pathology) of nerves.  
**Obstetrics:** science of the process of birth.  
**Odonatology:** science of the teeth.  
**Oology:** science of eggs.  
**Ophthalmology:** science of the eye and its functions.  
**Organography:** science of the organs.  
**Ornithology:** science of birds.  
**Osteology:** science of bones.  
**Otology:** science of the ear and its functions.  
**Paleontology:** science of extinct organisms.  
**Paleozoology:** science of extinct animals.  
**Parasitology:** science of parasites.  
**Phinology:** science of the nasal apparatus and its functions.  
**Pisciculture:** science (and art) of artificial rearing of fishes.  
**Protozoology:** science of protozoans.  
**Ricketology:** science of skeletons.  
**Somatology:** science of the body.  
**Teleology:** science of (alleged) effects of the first father on the progeny of a second, by the same mother.  
**Therology:** science of beasts.  
**Thremmatology:** the science of selective breeding of domestic animals.  
**Triebology:** science of the hair.  
**Zoogeography:** science of geographical distribution of animals.

## Sciences Primarily Concerning the Lower Animals or Concerning Man as an Organism

**ANTHROPOLOGY:** science of the human species.  
**Astronautics:** science (and art) of air flight.  
**Esthetics:** science of beauty and of appreciation of beauty.  
**Anthology:** science of flowers—used chiefly for flowers of expression or choice lyric verse.  
**Apologetics:** science of truth and falsehood in theological speculation.  
**Archaeology:** science of ancient works of man.  
**Archæthetism:** science of the supposed pervading mind preceding the existence of conscious animal life.  
**Assyriology:** science of ancient relics of Assyrian civilisation.

## Sciences Relating Chiefly or Exclusively to Man as a Member of Society

**Astrology:** science of the imaginary influences of the stars on human affairs.  
**Athletics:** science (and art) of bodily exercise.  
**Biography:** science of individual life records.  
**Demonology:** science of (supposed) spirits, mostly evil.  
**Dialectics:** science of argumentation.  
**Didactics:** science (and art) of instruction.  
**Dogmatics:** science of asserted truths.  
**Doxology:** science of belief (commonly used as the name of a brief song of praise).  
**Ceramics:** science (and art) of pottery and pottery making.  
**Chronology:** science of time.  
**Civics:** science of civil relations of man.

## Sciences Relating Chiefly or Exclusively to Man as a Member of Society (Continued)

## Exact Sciences

**Cookery:** science (and art) of preparing food for man with the aid of heat.  
**Criminology:** science of crime and criminals.  
**Economics:** science of proper relations of man.  
**Education:** science (and art) of mental development to man.  
**Egyptology:** science of ancient Egyptian civilisation.  
**Epistemology:** science of sources of human knowledge.  
**Eschatology:** science of "doctrines of uttermost things," more especially speculations as to a future state.  
**Ethics:** science (and art) of human conduct.  
**Ethnography:** descriptive science of men, races and tribes of men.  
**Ethnology:** science of the significance of races of men.  
**Ethology:** science of human behavior.  
**Etymology:** science of word-derivation.  
**Eugenics:** science of the conditions of being well born, as regards possibilities of development in the individual life.  
**Finance:** science of money as a medium of exchange.  
**Genealogy:** science of lines of descent by heredity.  
**Genesis:** science of origins.  
**Clyptology:** science of sculpture.  
**Graphics:** science of drawing.  
**Gymnastics:** science (and art) of muscular exertion.  
**Hagiology:** science of saints and of writings regarded as sacred.  
**Harmonics:** science of music and of harmony in sound.  
**Hellenics:** science of Greek culture.  
**Hermeneutics:** science (or art) of expounding sacred writings.  
**Homiletics:** science (and art) of teaching by spoken discourse.  
**Hymnology:** science of hymns or religious poetry.  
**Jurisprudence:** science of law.  
**Linguistics:** science of speech.  
**Logic:** science of proof in matters of cause and effect.  
**Medicine:** science (and art) of healing disease.  
**Metaphysics:** study of matters that transcend physical knowledge.  
**Military Science:** science of war and of methods of human destruction.  
**Mythology:** science of myths and legends.  
**Papyrography:** science (and art) of reading ancient records—on papyrus.  
**Pathology:** science of disease.  
**Pedagogy:** science of education in man.  
**Pediatrics:** science of disorders of childhood.  
**Pedology:** science of development of the child in man.  
**Pharmacutics:** science of drugs.  
**Pharmacology:** science of the effects of chemical substances on animal organisms.  
**Philology:** science of words and word evolution.  
**Philosophy:** a study of that which transcends human experience.  
**Phonetics:** science of pronunciation of vocal sounds.  
**Phonology:** science of vocal sounds.  
**Politics:** science of relations of men as citizens and as groups of citizens; the science of citizenship.  
**Psychiatrics:** science of nervous disorders.  
**Psychology:** science of nervous reflexes and mental operations.  
**Psychotherapeutics:** science of healing agencies operating through the senses (as suggestion, etc.).  
**Pugilistics:** science (and art) of fist-fighting.  
**Sciosophy:** study of the shadows cast by imperfections in science.  
**Sociology:** a group of sciences concerning human society.  
**Splanchnology:** science of the internal organs or viscera.  
**Surgery:** science (and art) of healing through cutting diseased or injured tissues or organs.  
**Telegraphy:** science (and art) of "distance-writing" by the use of the telegraph.  
**Telepathy:** science of (alleged) transmission of knowledge without the use of sense organs.  
**Telephony:** science (and art) of "distance-speaking" by means of the telephone.  
**Theology:** science of deity and of divine control of the universe; also of the opinions entertained by men in regard to these matters.  
**Therapeutics:** science of healing agencies.  
**Toxicology:** science of poisons or chemical substances pernicious to animal life.  
**Veterinary Medicine:** science (and art) of healing disease in domestic animals.  
**MATHEMATICS:** logic applied to space and number.  
**Algebra:** science of mathematical formulæ.  
**Arithmetics:** science of numbers.  
**Geometry:** science of measurements of space.  
**Horology:** science of measuring time.  
**Trigonometry:** science of measurement of angles.  
**Calculus:** science of calculations based on the conception of limit.  
**Non-Euclidian Geometry:** science of measurements of imaginary space, as space of four dimensions, or that imagined to have dimensions other than length, breadth and thickness.

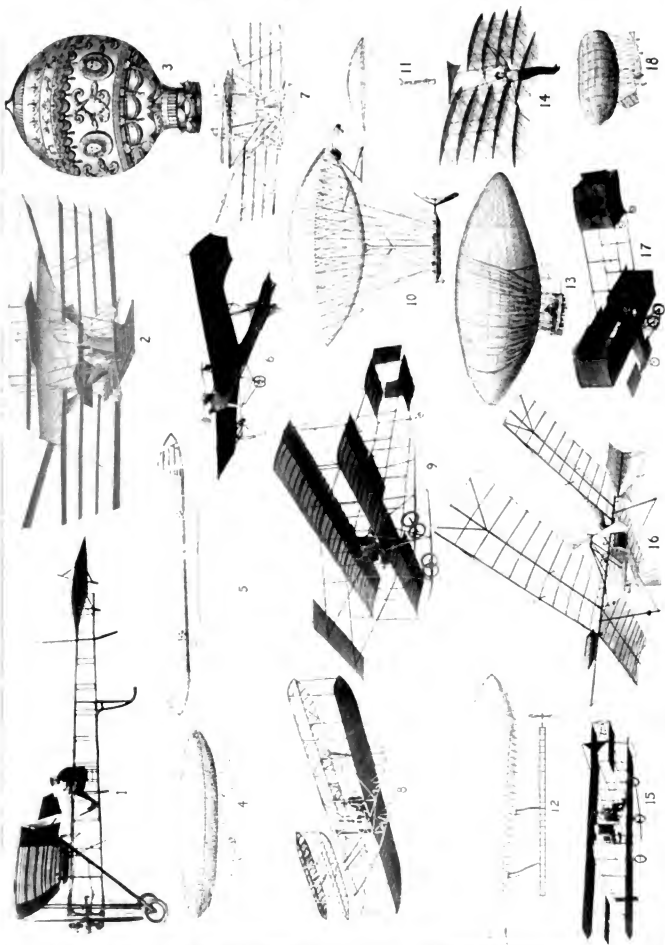
† The terms Andrology, Dermatology, Gynaecology, Laryngology, Obstetrics, Ophthalmology, Organography, and Somatology are applied chiefly to man, constituting branches of medical science.



1 Photograph of the Sun.  
2 The Moon, photographed at Lick Observatory.

3 Star Nebula, Milky Way.  
4 Typical Sun spot.

5 A Comet.  
6 Craters of the Moon, highly magnified.



1. Farman's Monoplane.  
2. Latham's Flying Machine.  
3. Montgolfier's Balloon.  
4. Latham's Flying Machine.  
5. Farman's Monoplane.  
6. Latham's Flying Machine.  
7. Latham's Flying Machine.  
8. Latham's Flying Machine.  
9. The Farman Machine.  
10. Dupuy de Lôme's Airship.  
11. Latham's Flying Machine.  
12. Latham's Flying Machine.  
13. Latham's Flying Machine.  
14. Latham's Flying Machine.  
15. Latham's Flying Machine.  
16. Latham's Flying Machine.  
17. Latham's Flying Machine.  
18. Latham's Flying Machine.

**AÉRONAUTICS.**—The art of sailing in or navigating the air, has occupied the ingenuity of men from the earliest ages. But it was not till the composition of the atmosphere had begun to be ascertained, and that means had been devised of filling vessels with heated air, or other air lighter than atmospheric air, and consequently capable of floating on it, that there came to be a rational prospect of succeeding in the "audacious attempt" of riding in the air.

**Balloon.**—In 1782, the brothers Montgolfier succeeded in constructing a balloon; and on the 21st of October, 1783, Pilâtre de Rozier, a young naturalist, and the Marquis d'Arlandes, ascended from Paris to an elevation of more than 3,000 feet, and alighted safely from their "aerial tour," after describing a circuit of about six miles.

The ascents performed by Gay-Lussac, who attained an elevation of  $4\frac{1}{2}$  miles, are memorable for being the first ever undertaken solely for objects of science. In 1802 Mr. Glaisher reached the estimated elevation of 37,000 feet, which was approximated by two German aeronauts at Berlin in 1901. The most daring attempt at an aerial voyage was that of the Swede, Andree, who, with two companions, in 1897 ascended from Spitzbergen in hopes of reaching the north pole, their fate remaining unknown.

The modern balloon is but a slight improvement on that invented by Montgolfier. In place of heated air or hydrogen, common coal gas is now used. This improvement was introduced by Mr. Green, the English aeronaut. As gas expands rapidly as the balloon ascends, and the pressure of the external air is diminished, the neck of the balloon is commonly left open, and the machine is also furnished with a safety valve at the top, which can be opened or shut at pleasure.

**Shape.**—The balloon is usually a large pear-shaped bag, made of pliable silk cloth, covered with a varnish of caoutchouc dissolved in oil of turpentine to render it air-tight. The ordinary size may range from 20 to 30 feet in equatorial diameter, with a proportionate height, but balloons of far greater dimensions have been constructed. A car, generally of wicker-work, supported by a network which extends over the balloon, contains the aeronaut; and a valve, usually placed near the top and to which is attached a string reaching the car, gives him the power of allowing the gas to escape, whereby the balloon is lowered at pleasure.

A quantity of sand ballast in small bags is usually taken, and when the balloon tends to descend too far sand is thrown out and it rises again. The guide-rope, a long and heavy rope trailing over the ground, is sometimes used when the country is such that no serious damage will result from its trailing. The principle of this device is that as the balloon tends to rise it must lift more of the rope off the

ground, while when the balloon sinks it is relieved of so much weight, and thus it will tend to float at one level above the ground. A parachute, a contrivance resembling a huge umbrella, is often used in ballooning, and by its means an aeronaut can leave a balloon and descend slowly to the ground.

**Steering.**—The problem of how to steer or propel a balloon in a desired horizontal direction can scarcely be said to have been satisfactorily solved, though numerous attempts at producing navigable balloons have lately been made. In a navigable balloon to be propelled through the air by some kind of motor—against the wind if necessary—the familiar balloon shape is departed from as quite unsuitable, and the airship is usually of an elongated form and more or less cylindrical or cigar-shaped. These are floated by gas, and propelled by a screw driven by a dynamo-electric machine, and steered by a large rudder.

Renard and Krebs, two other workers in this field, subsequently built an airship 165 feet long and  $12\frac{1}{4}$  feet in diameter, moved by a battery of Renard's invention, a dynamo and a screw 7 feet in diameter. This machine, in 1884, was driven at a speed of 12 to 15 miles an hour in calm weather, and had power enough to contend against a light breeze.

The names of Count Zeppelin and M. Santos-Dumont have recently become well known in connection with such balloons. From 1897 to 1910 the former constructed several huge cylindrical airships of great length, with paraboloid ends, divided into a number of separate chambers filled with hydrogen gas and these enclosed in an outer air balloon, the whole being braced and made rigid by an aluminium framework, and the means of propulsion being screws driven by Daimler petroleum motors and fixed to the longitudinal axis of the airship.

M. Santos-Dumont has constructed several navigable balloons, and one of them was so successful at Paris in 1901 as to gain a prize of 100,000 francs. On this occasion his airship made the journey from St. Cloud to the Eiffel tower and back again, a distance of about  $9\frac{1}{2}$  miles, in half an hour. In 1907, and since, the British army balloon department made remarkably successful experiments with air ships; and successes on the part of Count Zeppelin and others were also reported.

**Aviation.**—Besides balloons, which are lighter than a corresponding volume of air, and airships depending on the same principle, various apparatus have been constructed for aerial navigation that are heavier than the air. Attempts at navigation by means of such craft is termed *aviation*. Some of these machines are intended more for gliding or soaring through the air than for actual flight, having somewhat the nature of a huge bird with outstretched wings beneath which a man attaches himself and on springing from a height gradually descends to the bottom.

**Aeroplane.**—Hence the invention of the aeroplane, which shows a large flat surface con-

trived to float nearly horizontally in the air, but with the front edge very slightly raised, so that in being propelled rapidly along it receives the pressure of the air on the under side, the air thus tending to counteract the force of gravity. Sir H. S. Maxim in 1894 constructed a huge machine with main and several subsidiary aeroplanes, propelled by two large screws driven by steam engines of 300 horsepower, and able to rise with a great weight. As a model, at least, Prof. Langley's *aerodrome* had some success, flying through the air a distance of three-quarters of a mile. It had two rigid pairs of wings about 12 feet in width, with large screw-propellers between them driven by a small steam engine.

**Type of Aeroplane.**—Since the first aeroplane types of flying machines designed by Maxim and Lilienthal, the work of inventors and scientists along the line of motor-driven, heavier-than-air flying machines has shown a rapidly progressive. The general and most popular design is that of the simple aeroplane, supported by air, through which it is propelled by detached force. The aeroplane, it should be observed, however, consists of two types—the *monoplane* and the *biplane*. There have been many radical but experimental departures from the aeroplane type, none of which, however, has shown any great degree of success. Among these radical types is the helicopter, the production of Otto Luyties of Baltimore, Md. The design of the machine embraces several pairs of huge wings and two or more upright revolving propellers, the latter operated by a 100-horsepower motor for the purpose of lifting the machine. The entire weight is 1,700 pounds.

**Wright Machine.**—The first achievement, however, in the form of sustained flight, with power to rise and descend without mishap, and to guide the machine in a circular flight, is confined to the Wright brothers of Dayton, Ohio, one of whom, in 1906, remained in the air thirty-eight minutes and three seconds, making a circular flight of twenty-four and a half miles. The brothers Voisin also constructed an aeroplane on lines laid down by M. Octave Chanute, which was driven in a successful flight in November, 1907, at Paris by M. Henry Farman. The aeroplane on the first attempt rose slowly from the ground, and in one minute and fourteen seconds completed a circle.

Officials of the Aéro Club of America, at the international congress held in New York, 1907, admitted that in flights of man-carrying galeas machines the Wright brothers were far ahead of all competitors. What the Wright brothers have accomplished since 1908, in both this country and France, has marked a new era in aerial navigation; and the prolonged, flights of motor-driven aeroplanes, together with the recent work of Santos Dumont, Voisin brothers, Farman, Bleriot-Levasseur, Curtiss and other aeroplane builders and operators fills the future with great expectations.

#### NOTABLE EVENTS AND RECORDS IN AVIATION

AVIATOR	AEROPLANE	DATE	PLACE	TIME	DISTANCE	REMARKS
W. Wright	Biplane	Nov. 9, 1904	Dayton, Ohio	0:04:30	3 miles	Wright brothers made 105 flights in 1904.
W. Wright	Biplane	Oct. 5, 1905	Dayton, Ohio	0:38:00	24 miles	Wright brothers made 49 flights in 1905.
Santos-Dumont	Biplane	Nov. 13, 1906	Bagny, France	0:02:15 $\frac{1}{2}$	722 feet	His best record for 1906.
Delagrèze	Biplane	May 30, 1907	Bagatelle, France		656 feet	His best record for 1907.
Farman	Biplane	Oct. 26, 1907	Ivy, France		2,530 feet	His best record for 1907.
Bleriot	Monoplane	Dec. 6, 1907	Ivy, France		2,000 feet	His best record for 1907.
Petitefleur	Monoplane	Jan. 8, 1908	Buc, France		3,960 feet	His best record for 1908.
Farman	Biplane	Mar. 13, 1908	Ivy, France	0:01:28	4,921 feet	
Farman	Biplane	Mar. 21, 1908	Ivy, France		1,25 miles	



very gradual changes must be taking place. Apparent evidence of this is furnished by close comparative study of the planets. Proctor (1837-88), Flammarion (1842-19-), and Lowell (1855-19)—have devoted much attention to this speculative research.

We may summarize their conclusions briefly by saying that some of the bodies of the solar system (sun, Jupiter, Saturn, Uranus, Neptune) are as yet undeveloped to the life-supporting era, because of intense internal heat; others (earth, Venus, the Galilean moons of Jupiter, and possibly Mars) have a constitution and temperature hospitable to life; while still others (asteroids and lesser satellites, the moon, Mercury, and possibly Mars) have likely been habitable in the remote past, but are no longer capable of sustaining life.

The solar system is not at rest in interstellar space, but the sun with all its planetary freight is voyaging toward the northern constellation Lyra about twelve miles a second. Whether this motion is in a straight line or in a vast orbit around some stellar center is yet unknown.

**The Sun** is a dense, gaseous sphere, 866,000 miles in diameter, inconceivably hot (perhaps 10,000° F.), and 93,000,000 miles distant from the earth. The sun is exceedingly massive—330,000 planets like the earth fused in one would barely weigh as much as the sun. Gravity at the sun's surface is nearly twenty-eight times greater than here on earth—an average man would weigh a ton there. Slowly round on its axis the sun turns once in 27½ days.

**The Outer Surface of the Sun** is not solid, but atmospheric; and the phenomena of this surface confirm beyond question the existence of winds, tumultuous currents, not only eddies but up and down, in the vaporized materials composing the outer layers. Most prominent of these is the photosphere, an unbroken mass of incandescent cloud a few thousand miles in depth. Just outside the photosphere is a vapor-laden atmosphere called the reversing layer, probably less than a thousand miles deep. It causes the dark absorption lines of the solar spectrum first mapped by Fraunhofer (1787-1826), and named after him. Rising to vastly greater heights than the reversing layer is the chromosphere (color-sphere), chiefly hydrogen, calcium and helium, averaging seven or eight thousand miles in depth. Projected from the chromosphere, sometimes quiescent in form and again violently eruptive, are the scarlet prominences, or protuberances. All these interesting phenomena of the sun's surface are now photographed daily by means of the spectroheliograph of Hale (1868-19-) and Deslandres (1853-19-).

Far outside the chromosphere is a sort of quasi-atmosphere, seen only when the sun itself is totally eclipsed, and called the solar corona—an irregularly filamentous halo of pearly light, whose long streamers often stretch millions of miles into space, with the soft radiance of a comet or a distant searchlight. Its cause and significance are very obscure. In part at least, the corona seems to be an electro-magnetic phenomenon.

**Sun Spots.**—Spots on the sun are sometimes large enough to be seen without telescopic aid. They are well viewed through a small telescope by projection on a white screen. The largest spots are about 50,000 miles across, and the smallest are mere dark specks 500 miles in breadth. Spots are never permanent, though they sometimes endure for many months.

The dark center of a spot (umbra) is surrounded by a less dark, ring-shaped aureole (penumbra). After many days the umbra usually begins to break up by bridges of penumbral light forming across it, a train of small spots forms, and these gradually fuse into the general surroundings of the photosphere. Schwabe (1789-1875) first discovered that sun spot appear and disappear in a pretty regular period of 11½ years. They were very numerous in 1905 and fewest in 1900 and 1911. Spots are most frequent in solar latitudes 15 degrees north and south.

Students of the sun are not wholly agreed as to the cause and significance of sun spots. The true cause appears to lie in the sun itself; probably the spots are consequent on eruptions. Many of them are hollows, or depressions, in luminous matter ascending as well as descending. Frequently they are cyclonic, as demonstrated by recent photographs of Hale. Epochs of large or numerous spots are nearly always accompanied by displays of the aurora, magnetic disturbances and electric earth-currents, sometimes powerful enough to interfere with the working of telephones and telegraphs.

Whether sun spots, protuberances or corona have any effect upon the weather is not yet sufficiently proven. When spots have been very abundant, the weather (for the earth generally) has been sometimes less rainy, sometimes more so; sometimes warmer, sometimes colder, than the average. So that weather disturbances due to fluctuating conditions on the sun are at best very slight and undetermined. Faculae, or bright spots, are frequent near the edge, or limb, of the sun, and the spectroheliograph has proved that they exist everywhere on the sun's surface. Many of them are the tops of incandescent calcium clouds.

**Chemical Composition.**—Close study of the sun's spectrum for a half century has revealed many terrestrial elements in the sun in the vapor state—aluminum, calcium, carbon, cobalt, copper, hydrogen, iron, magnesium, nickel, oxygen, silicon, silver, sodium, titanium, zinc and many others. Iron, calcium, hydrogen, nickel and sodium are the most strongly indicated. But chlorine, gold, mercury, nitrogen, phosphorus and sulphur are not present.

**Light and Heat.**—So dazzling is the radiance of the sun that all artificial sources of light pale against it—even the arc light seems black by comparison. Even the spots emit light and are only relatively dark. The sun's total light surpasses that of the full moon 600,000 times. If the sun's heat could be fully utilized, the deck of a steamer on tropical oceans receives enough to maintain it at a ten-knot speed. The sun's light and heat are essentially constant, and their maintenance is satisfactorily explained on the theory of slow but continuous contraction upon itself by its own gravity. A practical method of converting the sun's heat into available mechanical energy will be one of the great discoveries of the future.

**The Moon,** nearest of all celestial bodies to us (239,000 miles), and brightest of all save the sun, is a solid, opaque sphere of very rough contour, traveling around the earth once in 27½ days. The moon's motion easterly from night to night is obvious, if we refer it to the stars; and it passes over its own breadth (about half a degree) every hour. Occasionally a star is hidden behind it (occulted)—a very sudden phe-

nomenon at either disappearance or re-appearance. Sometimes a planet suffers occultation; and when the moon occults the sun, a total eclipse takes place. A fortnight earlier (or later) an eclipse of the moon itself is liable; but this is due to the moon's passing through the earth's shadow, so that sunlight is for the time withdrawn from it.

**Light.**—Half of the moon's sphere is always illuminated by the sun, and it is the amount of this illuminated half turned toward us that causes the moon's phases. Much of the time between new moon and either quarter, the sallow light of the unilluminated part of the moon's disk is faintly visible, called the "old moon in the new moon's arms." It is caused by sunlight reflected from the earth. Eastward progress of the moon makes it rise on the average about three-quarters of an hour later from night to night. The full moon of autumn rises with a daily retardation of less than half this amount; so they are called (in September and October) harvest moon and hunter's moon.

The spectroscopic shows that the moon's light and sunlight are identical in composition. We often say the full moon is as bright as day, but a half million full moons would not equal the sun's radiance.

**Dimensions.**—The diameter of the moon is 2,160 miles, easily ascertained after her distance is found. The distance is not difficult to determine, once we know the size of the earth, and can tell the straight-line distance between two observatories, as Greenwich and Cape Town. This becomes a base-line from which the distance between the earth's center and the moon's can be found by a trigonometric solution. Eighty-one globes like the moon rolled into one would equal the mass, or weight of the earth, and surface gravity is a sixth what it is here on earth; an average man would weigh but 25 pounds there, and an athlete with terrestrial thighs would find a 30-foot standing jump mere exhilaration. The moon turns round on its axis very slowly—only once, in fact, while it is making one complete journey round the earth. So that the half turned toward us is always the same, and no one has ever seen the other side of the moon. Her atmosphere, if the moon has any, must be very light; and water, if at all, must exist as ice.

**Heat.**—Lacking an atmosphere to absorb and retain the solar heat, the lunar surface must always be intensely cold. Moon's perigee (least distance) and apogee (greatest distance) cause a slight disturbance of magnetic needles; but the changing phases of the moon, especially the angle of the cusps with the horizon, are not responsible for any weather changes that the critical expert has ever been able to discern.

**Surface.**—The moon's surface is highly diversified by a wealth of smooth, darkish patches, named *mares* (seas), now regarded as desert plains; a few mountain chains; hundreds of rills or valleys; numerous systems of radiating streaks; and over 30,000 ring mountains of all sizes from a mile in diameter to a breadth sixty times that. All details of the lunar surface are mapped and named. Hevelius (1611-87) of Danzig made the first map of the moon, and Schmidt (1825-84) of Athens the last. The recent photographic atlases of the Lick and the Paris observatories show the lunar surface very satisfactorily, and Ritchey (1864-19-) attained even greater success with the Yerkes telescope. Changes on the

moon, if at all, are on a very small scale, too minute for detection with present instruments.

**The Planets.** in the order of their distance from the sun, are Mercury, Venus, earth, Mars, asteroids (about 700), Jupiter, Saturn, Uranus, and Neptune. No planets have yet been discovered inside of Mercury's orbit, or outside that of Neptune. Venus is the brightest planet, and Jupiter comes next. With Mars, Saturn and Mercury, these are all that are easy to see with the naked eye.

**Inferior and Superior.**—Mercury and Venus are classified as inferior planets, because their orbits are within the earth's; all the others are superior, that is, outside the earth's. To the naked eye none of the planets have appreciable disks or phases, but with the telescope Mercury and Venus pass through all the phases of the moon. Of the superior planets Mars alone exhibits a considerable phase, being at times gibbous, or like the moon two days from full.

**Motion.**—The planets are so named because they appear to move among the stars. The general trend of their motion is eastward (direct motion) along the ecliptic, or sun's apparent path. But during a part of each year every planet also travels westward (retrograde motion). When nearest the earth a planet's motion is retrograde; when farthest, direct. The ancients explained this forth and back motion of the planets by means of the epicycle of the Ptolemaic system; whereas it is really due to composition of earth's and planet's own motions around the sun.

Venus is a bright evening star in the western sky in August 1911, March 1913, October 1914, May 1916, December 1917 and August 1919. Mercury and Venus when nearest are at inferior conjunction; superior planets when nearest are at opposition. At inferior conjunction, Mercury and Venus sometimes pass directly between earth and sun, called a transit.

Dates of transit of Mercury are May of 1878, 1891, 1924 and November of 1868, 1881, 1894, 1907, 1914. Transits of Venus are much less frequent—December of 1631, 1639, 1874, 1882 and June of 1761, 1769, 2004, 2012.

For all details of motion of the planets, their distance from earth and sun, and positions in the sky at any time, consult the *Nautical Almanac*, a mathematical work based primarily on what are termed the "elements of the orbits." These technical quantities express with accuracy the size, form and position of the planetary orbits in space.

PLANET'S NAME	DISTANCE FROM THE SUN	ECCENTRICITY OF ORBIT	INCLINATION TO PLANE AND OF ECLIPTIC	TIME OF REVOLUTION AROUND THE SUN	LENGTH OF PLANET'S DAY	DIAMETER OF PLANET IN MILES
EARTH'S EQUALS UNITY	IN MILLIONS OF MILES					
Mercury.....	0.39	36	0.206	7° 0'	88d.	3,000
Venus.....	0.72	67	0.007	3° 24'	225d.	7,700
Earth.....	1.00	93	0.017	0° 0'	365½d.	7,900
Mars.....	1.42	142	0.093	1° 51'	68½d.	4,200
Jupiter.....	5.20	483	0.048	1° 19'	12y.	87,000
Saturn.....	9.54	886	0.056	2° 30'	29½y.	73,000
Uranus.....	19.18	1780	0.046	4° 45'	84y.	36,000
Neptune.....	30.06	2790	0.009	1° 47'	165y.	30,000

**The Northern Lights** (aurora borealis of the northern hemisphere, and aurora australis of the southern) are a phenomenon of the earth's atmosphere. This composite, compressible gas is rather less than one-millionth the earth's weight, is a hundred miles or more in depth, its density increases rapidly downward, and at the

bottom of this ocean of air humanity lives and moves and has its being. The atmosphere bends downward the rays of light coming from all celestial bodies, causes the twinkling or scintillation of the stars, and the common phenomena of dawn and twilight. The aurora is another phenomenon of the atmosphere, a soft, vibrating luminosity, streaming upward into the sky sometimes to the zenith, exhibiting greenish yellow, pale blue and other tints, occasionally with pulsating streamers. The semiperiodic recurrence of the aurora connects it with sun spots and protuberances. The magnetism of the earth as influenced by the condition of the sun appears responsible for the aurora, a species of luminosity in the very rare gases of the upper atmosphere.

Comets nearly a thousand in number have been recorded within historic time. Half have had the paths of their motion in space ascertained. If the orbits of two or more are the same, it is generally true that they are not different comets, but the same body moving in an elliptical track around the sun, which is situated (as in planetary orbits) at one focus of the ellipse.

Halley (1686-1742) first made this important discovery, and the comet which in consequence bears his name returns to the sun at intervals of about seventy-six years. Before his time comets were thought to move in straight lines through space. So it seemed quite possible that a comet might collide with the earth and wreak destruction thereon. In such case, however, collision would doubtless destroy the comet.

**Description and Development.**—If we conceive of a vast congeries of separate particles, varying in size from grains of sand to that of large buildings, these masses not compacted together but loosely related or hundreds of miles apart, traveling in shoals through space, we shall have the modern notion of a comet. During most of the time comets are dark invisible bodies; but, on approaching the sun within 500 million miles, they gradually begin to glow with a self-luminosity, and are visible in the telescope as faint, round patches of cloud-like light. Their true nature is detected by apparent motion among the stars from night to night. Most telescopic comets never develop beyond this simple stage; but the larger ones, on approaching near the sun, form first a nucleus, then a corona, or head with curving envelopes, or sheaths, sometimes opening toward the sun like an unfolding fan. Later follows development of the tail, quite invariably on the side away from

the straight tails due to hydrogen, the slightly curving ones to hydrocarbons, and the stubby, sharply curved tails to vapor of iron or chlorine. The shaggy tail is formed at the expense of the head and its particles never return to the comet again. A slow disintegration thus takes place at every return. When near the sun the head of a comet shines very faintly by reflected solar rays, and the spectroscope shows that the light of comets is mainly due to hydrocarbons, cyanogen and sodium.

**The Great Comets and Their Discoverers.**—Two French astronomers, Pons (1761-1831) and Messier (1730-1817) are the most famous of all discoverers of comets. In America Swift (1820-19—), Brooks (1844-19—) and Barnard (1857-19—) have been most successful. Discoveries are now sometimes made by photography. Encke's comet moves around the sun in the shortest period (3½ years), and is noted also for freaky changes of form. The largest and brightest comet ever seen came in 1843, stretching from horizon to horizon. It approached nearest to the sun of all known comets, and was visible to the naked eye at noon. Probably the outer regions of its head brushed through the streamers of the solar corona. Its velocity at perihelion was more than one and a quarter million miles per hour, and its tail was 150 million miles long. This comet will not return for 500 years. Other very bright and striking comets appeared in 1811, 1858 (Donati's), 1861, 1874 (Coggia's), 1882, 1887, and 1910. In extreme cases comets are visible a year and a half to two years. Occasionally one is discovered during a total eclipse of the sun (as in 1882 and 1893), and never seen again.

**Meteors,** or shooting stars, are fragments of comets rendered luminous by impact and friction with our atmosphere. Comets have been caught in the act of breaking up, as Biela's in 1845-6, and Brooks' in 1893. Generally, however, disintegration takes place very slowly, and the cometary fragments are thus scattered everywhere along the paths of these bodies. Showers of such fragments come within reach of the earth's attraction every day. For the most part they are dissipated in the upper air; but occasional fragments that reach the earth's surface, called meteorites, are found by chemical analysis to have the same constitution as comets themselves. Meteorites are either stones or irons, the latter yielding a large percentage of nickel. Fine American collections of meteorites are in the museums of Chicago, New York, Washington, Cambridge, New Haven and Amherst.

**The Stars** are situated at incomprehensible distances from the depths of space. To express these enormous distances, an astronomical unit is employed called the light-year: it is nearly six trillions of miles in length, and is the distance that a light-wave (whose speed is 186,000 miles per second) travels in a whole year. So astronomers have ascertained that Alpha Centauri, the nearest known fixed star, is four light-years away, Sirius is double that, Vega thirty light-years, Polaris seventy, and Castor 120, and so on.

**Classification.**—The stars are variously classified, first by their apparent magnitudes, or order of brightness. There are about twenty stars of the first magnitude, sixty-five of the second and 200 of the third, proceeding in geometric progression; 5,000 of the sixth, 720,000 of the tenth magnitude, and so on. An average first-magnitude star gives two and a half times more light than one

the sun. Often it stretches through space many millions of miles, giving the comet a bizarre and spectacular appearance which no other heavenly body possesses.

Comets sometimes have two or more tails; one had six (in 1744). Differences in the curvature are perhaps due to the nature of the volatile gases composing them—

of the second magnitude, and so on, by a nearly constant relation. In a clear, dark sky the average sixth-magnitude star is the faintest visible to the naked eye.

But the telescope reveals stars fainter and fainter, until the seventeenth magnitude is reached, as a *minimum visibile* in a forty-inch lens. Keeping pace with their diminution in brightness, the number of the stars increases, until their total is estimated at 150 millions. Dark or non-luminous stars there are also, and some astronomers think these exceed the luminous ones in number. The total light from all the stars is rather more than a hundredth that of the full moon.

**Colors.**—Another but less marked classification of the stars is by their colors; still another by their spectra, of which there are not less than five types, by the scheme of Secchi (1818-78):

(I.) *Sirians*, stars with spectra resembling that of Sirius, with broad, dark hydrogen lines.

(II.) *Solars*, with spectra resembling the sun's, with fine, dark metallic lines. Practically all the stars are evenly divisible between types I. and II.; and stars of type II. are least remote from the sun.

(III.) *Dark*, banded spectra, with bands well-defined on the blue-ward side.

(IV.) *Spectra with dark bands, or flutings*, fading out toward the blue. Stars of this type are few, faint, blood-red in hue, and their atmospheres are charged with carbon.

(V.) *Stars with bright-line spectra*. Classification of stars by their ages, indicated by the character of their spectra, has been attempted. The spectra show that as the stars are younger, the brighter, and then faint (minimum) for a relatively brief span. Such fluctuations of brightness are due to temporary occultation by a large, dark star whose orbit lies nearly edgewise to our vision. Others are called *Umicron Ceti variables*, also after the type star, often called "Mira the Marvelous."

Variables are especially numerous in the thick fields of star clusters. New stars are a type of variable which increase vastly in brightness in a few days or weeks, and then slowly wane or disappear, as *Nova Persei* in 1901, which for a brief period outshone *Capella*, and then gradually faded into a faint, encircling nebula. Of double stars more than 10,000 are now catalogued—stars with a nearly companion usually much fainter than the bright component. Burnham is the chief American discoverer of these objects. Hundreds of doubles belong to the class of binaries, whose components revolve around their common center of gravity in an elliptic orbit, generally in a long period of years. These paths are usually very eccentric, and the masses of the stars often nearly equal.

A similar type has been discovered, called the spectroscopic binary. In such the components are so near each other that the telescope unaided is powerless to divide, or separate them; therefore their spectra overlap. *Capella*, *Castor*, *Polaris* and *Spica* are spectroscopic binaries. Of all the stars so far examined, nearly one-

tenth reveal orbital motion. Multiple stars are those with many components: *Epsilon Lyrae*, near *Vega*, is a beautiful system of this sort.

**Star Clusters** are either loose, as the *Pleades*, with a few scattering bright stars in a region where the photographic plate shows many thousands; or close, like that in *Perseus*, with thousands of stars compactly aggregated and forming a denser region of the Milky Way. The whole of this marvelous galaxy, stretching all the way around the heavens, is made up of millions of minute stars, each comparable in size and constitution with our sun, and so immensely remote that their effect is that of a continuous sheet of faint luminosity.

The distance of stars can be stated intelligibly in light-years only, and their location around the sun seems nearly central, like the girle of meteoric masses comprising the ring of Saturn.

**The Nebulae** are located among the stars, and 12,000 are now known and catalogued. They appear like faint masses of luminous fog, mostly irregular in form and brightness. Many nebulae are glowing, incandescent gases, mainly hydrogen, as the spectroscopic shows. Some, however, are resolvable into separate faint stars, as in the Milky Way; a few are variable; and as a whole the nebula appear like the residue of original chaos from which the universe has, through uncounted millions of years, come into its present state.

**Classification.**—Nebulae are often classified as (1) annular, or ring-shaped, (2) spiral, (3) planetary, (4) nebular stars, (5) irregular nebulae, for the most part large, of which the great nebula in *Orion* is the finest example. Its light emanates from incandescent hydrogen and helium, it is intimately related to the neighboring stars of the constellation, its distance from the sun is increasing eleven miles a second, and this incomparably vast structure of tangled wisps and twisted cloud-shapes has, like nearly all the other nebulae, persisted for centuries without any certain change of form.

The nebulae are more thickly scattered toward the poles of the Milky Way, and their existence suggested the famous nebular hypothesis of Kant and Laplace, which forms the basis of the cosmogony of the present day.

**Cosmogony** is the science of the development of the universe. Beyond a shadow of doubt the universe is inconceivably old, and has come to its present being by an orderly process—an evolution through the long-continued action of fixed natural laws, especially the law of universal gravitation. For countless ages the universe existed only potentially; the celestial spaces were tenanted by nebulous masses of gas, "without form and void." Every molecule attracted every other molecule; centers of attraction formed, and as they drew other masses inward upon themselves, the collision of particles and friction upon each other developed heat; the gaseous condensations grew hotter and hotter; thousands upon thousands of nebular nuclei formed; condensation progressed, in some regions more rapidly than others. The sun itself, in its early history, was one of these centers, every star was such a center, or became one, in the slow process of world-building. As the gaseous masses could not usually fall directly toward their centers of attraction, huge nebular whirlpools were set in motion. No spiral nebulae were known to Laplace;

the first was discovered by Lord Rosse; but thousands were found by Keeler at the Lick Observatory, by means of photography. Next to the star itself, the spiral nebula is the type of object most frequent in the sky. Their existence is in full accord with the principles of dynamics, as pointed out by Chamberlain and Moulton in their planetesimal hypotheses.

Progressive development from a formless nebula tends toward the flat, revolving disk; contraction makes the inner regions whirl more and more rapidly, thus producing the spiral, or whirlpool structure. So the spiral nebula became the fundamental natural form. In great part the stellar systems, then, and probably our planetary system also, had their origin, not from Laplacian rings left behind as the nebular disk contracted, but from condensation into knots of nebulosity, ever and anon detached from the whirling nebulous mass, each knot subsequently condensing into a separate star or planet.

So Keeler's significant discovery of multitudes of spiral nebulae has greatly strengthened the evidence in general favor of a nebular hypothesis of origin of the stellar and planetary systems throughout the universe.

**BOTANY.**—One of the natural sciences, dealing with plants, as zoology deals with animals. In its widest sense it includes all kinds of inquiries in regard to plants, their structure, activities, distribution, origin, classification and uses. In fact the study of botany in its entirety includes every inquiry that may be made with regard to plants themselves and their relations to man and other living things, although for convenience the economic relations of plants are now more commonly relegated to agricultural, horticultural, forestry and pharmacy, while the more scientific problems are retained in botany.

**Departments of Modern Botany.**—The science may be divided for convenience into about ten departments, although sometimes fewer and again more divisions are recognized. The following is a conservative treatment:

**Cytology** deals with the minute structure of plants, especially with the *cells*, of which all plants are composed. A typical cell consists of a minute body of protoplasm (a softish nitrogenous substance) surrounded by a permeable membrane (wall of cellulose). The protoplasm is differentiated into a central denser, roundish part (nucleus), surrounded by a more watery part (cytoplasm). A still further differentiation has been made out for both nucleus and cytoplasm, the protoplasm consisting of a more active granular or fibrillar part (kinoplasm) scattered through the less active, nearly clear part (hyaloplasm). Moreover in the cytoplasm there are generally several (rarely one) rounded bodies of denser cytoplasm which are stained by a green pigment (chlorophyll).

Cells are the living units, and they produce other cells, and so increase the bulk of the plant. The usual method of the production of new cells is by the division of a cell into two. This is done by the cell itself, and in the process the granular matter of the nucleus (kinoplasm) divides itself very exactly into two equal portions, each of which becomes surrounded by its half of the clear nuclear matter (hyaloplasm); these equal parts of the nucleus now constitute two new nuclei, and each now draws around it its half of the cytoplasm. Thus there are now two cells

where there was but one, and these generally build up a partition wall between them.

**Histology** deals with the *tissues* as made up of different kinds of cells. Here a mass of similar cells constituting a portion of the plant substance is known as a tissue; accordingly tissues may be of as many kinds as there are kinds of cells. A convenient classification of tissues is as follows:

**Rudimentary Tissue** (meristem) consists of young, thin-walled cells which are still undergoing modification. It constitutes the bulk of all rapidly growing parts of plants.

**Soft Tissue** (parenchyma) consists of mature, thin-walled, usually short cells which have attained their growth, as the tissue of ripened fruits, the green tissue of leaves, etc.

**Thick-Walled Tissue** (collenchyma) consists of long prismatic cells with thin walls, but with the longitudinal angles much thickened. It occurs as a strengthening tissue just beneath the epidermis in many stems.

**Stone Tissue** (sclerenchyma) consists of thick-walled, usually short cells so tightly packed together that they form a hard mass, as in the shells of nuts; e. g., hickory nuts, walnut, filberts, etc., and in the "stones" of many fruits, as plums, cherries, etc.

**Fibrous Tissue** consists of thick-walled, elongated cells so tightly packed together that they make up the fibrous part of the wood (wood fibers) and bark (bark fibers) of the stems of most higher plants.

**Sieve Tissue** consists of elongated, usually large cells, more or less united into tubes, and having only slightly thickened walls. The name is given on account of the fact that the transverse partitions between the cells are perforated in a "sieve-like" pattern, and through these perforations the protoplasm connects from cell to cell. Sieve tissue occurs in the young bark.

**Tracheary Tissue**, like the preceding, is a tubular tissue, but here the continuity of the cavity is usually more complete. The walls are somewhat thickened, in rings, spirals, or reticulations. When young these tubes contain protoplasm, but eventually they contain air. Tracheary tissue occurs in the woody parts of stems and leaves.

**Milk Cells and Tubes** (lactiferous tissue) occur singly or in masses in many plants, and are easily recognized by their milky contents, as in the many kinds of milkweeds. The milk (latex) is often very poisonous, while more rarely it is wholesome. In some cases it contains caoutchouc, from which india rubber is manufactured.

**Morphology** deals with form as applied to the plant as a whole, or to corresponding parts. With respect to the latter it considers especially the correspondence and equivalence of parts of plants.

**Plant Body**.—Every kind of plant has a "body" of a more or less definite form. In every simple (primitive) plant the body is a single more or less rounded cell. There is the hint of root, stem or leaf. Plants a little higher are unbranched rows of nearly similar cells. Next the body is a row of cells differentiated into base and apex, the former rooting, the latter growing terminally. Branching simple rows rooted basally and growing terminally constitute a higher type.

A still higher type is seen where the

rows of cells are not simple, but consist of several parallel cells. From this structure, which is very common in aquatic plants, especially the red seaweeds, the step is an easy one to massive structures, as in the brown seaweeds and the flat plant bodies of many liverworts. Eventually the type of body characteristic of higher plants is reached, in which there are roots, stems, and leaves.

**Physiology** has to do with the activities of plants, particularly those that relate to nutrition, growth and reproduction.

**Absorption**.—In the nutrition of plants the first stage is that of absorption of food-matter, which includes the imbibition of water and the solutions held in it, and the absorption of various gases. Naturally those parts of the plant which are normally in contact with the water are those which absorb water, and in like manner those parts which are normally in contact with the air absorb gases, and it is pretty certain that this has come about as an adaptation of each part to its environment.

The method of absorption must be little more than a simple diffusion through the permeable membrane of the cell-wall. It is found that gases and watery substances are absorbed indiscriminately, and that the plant does not have any "power of selection." Thus the plant is supplied with everything gaseous or soluble with which it is in contact. If these are sufficient for its needs, and none is harmful, the plant may thrive, otherwise it will starve.

Ordinary higher plants in their development have accustomed themselves to many of the solutions in common soil, and apparently they are so habituated to these solutions that they languish without them. On the other hand there are solutions that are known to be quite essential; for example, those that contain nitrogen and phosphorus. The gases of importance to plants are carbon dioxide, and oxygen, both of which occur in sufficient quantities in ordinary air.

**Synthesis**.—The food matters absorbed are subjected to certain synthetic processes by which they are made more available for the plant at large. Thus some of the water and the carbon dioxide are broken up and recombined into carbohydrates of definite composition, which are then available for the use of growing cells.

This particular synthetic process, since it requires light for its accomplishment, is known as photosynthesis. It takes place only in the green cells of plants, and is thus the chief function of the leaves of higher plants. The product of this synthesis is usually a sugar, containing carbon, hydrogen and oxygen (commonly  $C_6H_{12}O_6$ ), which is commonly changed to starch ( $C_6H_{10}O_5$ ).

**Growth**.—The carbohydrates formed are sooner or later used as proper food for the cells, and here we may use the terms "digestion" for the earlier steps, and "assimilation" for the later steps. The result is that the cells are nourished and increased in substance. This increase in the substance of the cell due to the nourishment by carbohydrates is what we know as growth. Yet in ordinary growth there is usually another factor, namely, the forcible distension and enlargement of the cell by the imbibition of a great amount of water.

And so it is with the growth of tissues, each cell of which increases in substance by the assimilation of carbohydrates (mainly) and increases in size by the

distension due to its forcible imbibition of water. Along with this increase in substance and size in tissues there is usually an increase in the number of cells, by cell division as described.

The growth of organs and parts of plants is essentially like that of tissues, but here we have to do with more considerable masses of meristem cells in which cell division is the characteristic feature, especially in the earlier stages, and cell distension of the later stages.

**Water Loss**.—During the nutrition and growth of plants that grow partly or wholly in the air they are more or less constantly subject to a considerable loss of their water by evaporation, and unless there is a constant supply of water to counterbalance this loss such plants will dry up and die.

**Reproduction**.—All plants reproduce in some manner. Some merely break into fragments, each of which then grows into a new plant. This simple method is more common with lower, simpler plants, but that it still persists among some of even the higher plants is shown by the ease with which new plants may be grown from "cuttings."

Many lower plants regularly separate certain cells (spores) from particular portions of the plant body, and these on germination give rise to new plants. In many water plants such separated cells are motile by means of cilia, hence called zoospores. Such production of new plants is known as the asexual (nonsexual) reproduction.

In addition to the asexual modes of reproduction most plants reproduce sexually also. In its simplest form sexual reproduction consists of the union of two free-swimming similar zoospores (isogametes). The resulting cell sooner or later grows into a plant like that which gave rise to the isogametes. In passing upward we find successively free-swimming but unlike gametes (heterogametes), one free-swimming gamete (sperm), and one motionless gamete (egg); both gametes (sperms and eggs) motionless, and dependent upon other agencies for coming in contact with each other. The latter is the condition in the flowering plants.

Physiologically, sexual reproduction is a special activity of certain cells wherein two fuse into one, thus producing a new cell somewhat different from either. This in its growth produces a plant somewhat different from the plant or plants which produced the sexual cells. Sexual reproduction is thus a mode of growth. It is also a mode of variation.

**Pathology** considers the diseased or abnormal condition of plants. As physiology has to do with the normal, healthy activities of plants, so pathology has to do with abnormal activities. Diseased conditions of plants are due to many causes, which may be summarized as follows:

**Physical Injuries**, which may include all kinds of purely mechanical rupture, cutting or puncture of the tissues, due to wind, lightning, hail, or other violence, and the eating by insects, birds, and other animals. The mutilation by such agents interferes with the normal function of the plant. In this place may be named some of the injuries due to too low temperature (freezing) or too high a temperature (scalding) and probably also the scalding or scorching effect of too intense light.

**Errors of Nutrition** may include all cases where there is an insufficient amount of any or all of the food substances, in-

cluding water, solutions, gases, and the carbohydrates and other more complex nutrients. Here the word "starvation" may properly be used. When plants are supplied with too little light they suffer from starvation, there being a deficiency in carbohydrates. So also plants in too low a temperature are not able to make use of available food substances, and starvation is the result.

**Parasitic Injuries** may be due to the presence of living animals or plants in the tissues. Under the former the most notable are the nematodes, which are very minute thread-like worms, which seriously injure the parts of the plants that they infest. The nematode disease of sugar beets is a good example, as also the root-knot nematode disease of many different kinds of plants.

Of the plant parasites the most common are bacteria of several kinds which destroy the cells in certain tissues, as in apple blight; external fungi which injure young twigs and leaves, as the powdery mildews; internal fungi which grow through the tissues of stems and leaves, injuring or wholly destroying them, as in rusts, smuts leaf-spot diseases, fruit rots, etc.; flowering plant parasites, as the dodder, mistletoe, etc., which often attack plants and distort or destroy the stems, as clover dodder, pine mistletoe, etc. The number of known disease-producing parasites is very great, and the literature on the subject is very voluminous.

**Ecology** deals with the relations of plants to their environment. It has been recognized as a distinct part of botanical study for less than twenty years, and is still associated with physiology, of which it is an extension and development. It is sometimes spoken of as out-of-door physiology, and it certainly has led to a closer study of plants in their natural environment than had been the practice in ordinary plant physiology. How plants affect one another, how they come to occupy particular habitats, and how these affect the plants themselves, are among the more common inquiries made by the ecologist.

**Phytogeography**, or geographical botany, as it is more commonly called, includes all the inquiries that relate to the distribution of plants throughout the world. In its more local inquiries it is identical with ecology, but its scope is much broader in its world-wide application.

**Phylogeny and Taxonomy** deal respectively with the descent and consequently the relationship of plants, and their natural classification.

#### Outline of the Taxonomy of Plants.

Botanists are now somewhat acquainted with about 200,000 different kinds of plants, at least they have given names to that many and assigned them to their orders and families.

A careful consideration of this vast mass of plants enables us to recognize a dozen or more rather well-marked groups of related forms. These groups are regarded as the results of definite development along as many evolutionary lines and to these groups thus understood we now apply the name "phyla." So a phylum is a group of related plants, their relationship being due to the fact that they have had a common origin. Beginning with the lowest the phyla are as follows:

The **Blue-Greens** (*Myxophyceae*) are minute water plants of such simplicity of structure that we are warranted in giving them the lowest place in the vegetable kingdom. Their cells for the most part do

not have definite nuclei or chromatophores, and their walls are usually soft and more or less gelatinous. The color of the cells is never a bright green, but is blue-green, brown-green or smoky-green. They reproduce by fission, and the production of asexual spores, and there is no sexual reproduction whatever.

About 2,000 species are known, including many "bacteria" which are here regarded as blue-greens that have become heterophytic and as a consequence have lost their coloring matter.

The **Lower Green Algae** (*Protophyceae*) are also minute water plants, but their cells have well developed nuclei and chromatophores, and their walls are usually firm. Their color is a bright green, due to the presence of typical chlorophyll.

Like the preceding, these plants reproduce by fission, but in addition many of them form motile cells (ciliated zoospores) which swim away and eventually grow into new plants. Some of these zoospores fuse when two meet, the result being a new cell which then grows into a new plant, this process constituting a simple sexual act. There are above 1,100 species of the lower green algae now known. The lower members of the phylum are unicellular, but for the most part they are filamentous plants.

The **Pond Scums** (*Zygnophyceae*) are typically filamentous plants in which a marked sluggishness of habit has entered to such an extent as to have materially modified their structure. Although filamentous, the plants for the most part very easily break into segments, or single cells. Although related to zoospore-forming plants in the preceding phylum, they do not form zoospores, nor do they have free-swimming ciliated gametes; on the contrary the protoplasts of two contiguous cells sluggishly fuse together.

In the treatment here suggested the more filamentous forms are considered more primitive, and those in which the filaments segment early into single cells or short filaments of few cells are regarded as the later, or derived forms.

All told there are about 7,000 species of the pond scums and of these the diatoms include by far the greater number.

The **Tube Algae** (*Siphonophyceae*) show another peculiar modification of the filamentous structure found in the lower green algae, whereby the filaments instead of forming cross-walls to separate their cells are left partly or wholly tubular. In other respects the tube algae resemble the lower green algae, from which phylum they no doubt originated.

There are about 1,100 known species of tube algae.

The **Brown Algae** (*Phaeophyceae*) include plants ranging from small filaments to large massive plants many meters in length. They are peculiar in having a brown-green coloring matter instead of the bright green chlorophyll of ordinary plants. They are here regarded as a marine modification and development from the filamentous lower green algae.

The brown algae number somewhat more than 1,000 species.

The **Red Algae** (*Carpophyceae*) are green plants almost wholly marine, whose green color is mostly hidden by an additional red coloring matter which suffuses the protoplasm of the cells. The simpler species are filamentous and often very minute, but many of the higher species are large massive plants of a complex structure.

The red algae number about 3,200

species, by far the greater part of which are red or purple in color.

The **Fungi** (*Carpomycetaceae*).—Here are brought together a vast number of heterophytic plants, apparently related to the plants of the phylum just preceding, but which in becoming dependent have lost their green color, in addition to suffering many other changes.

**Structure.**—The plant body in all fungi is very simple (no doubt reduced), consisting of slender filaments which creep through the substance or the tissues upon which they feed. In most cases there is an asexual form of reproduction consisting of cells (conidia) that separate from the ends of certain filaments, and on germinating grow into new plants.

This phylum contains an enormous number of species, no less than 63,700 being enumerated in systematic works at the present time (1911), and every year hundreds of additional species are being identified and described.

The fungi may be summarily outlined as follows:

1. **Class Acosporae**, the sac fungi, including about fifteen orders and over one hundred families. Here we find the beetle fungi, the powdery mildews, black fungi, black lichens, script lichens, cup fungi, cup lichens, morels, tubers, etc.

2. **Class Teliosporae**, the rusts and smuts, including two orders and five families of excessively parasitic plants which live in the tissues of higher plants.

3. **Class Basidiomycetes**, the basidium fungi, including nine orders and twenty-two families. Here are found the subterranean fungi, stinkhorns, puff-balls, bird-nest fungi, toadstools and mushrooms, pore-fungi, bracket-fungi, shell-fungi, ear-fungi, jelly-fungi, etc., in all of which the structure which we see is the spore-fruit, while the plant itself is the webby mass of filaments from which the spore-fruit grew. Thus the toadstool, or any well-known umbrella-shaped structure, is the fruit of the minute filamentous plant growing beneath the surface.

The **Mosses** (*Bryophyta*) are green plants of a markedly higher degree of development than any of the preceding phyla. In them we have for the first time a distinct alternation of sexual and asexual generations in the round of life. Thus one generation produces the sperms (in antheridia) and eggs (in oogones) and the fertilized egg develops a second generation which does not produce sexual organs, but produces spores, and when the spores germinate they grow into sexual plants, and so on. The two generations are known in science as (a) the gametophyte, that is, the gamete-producing plant, (i. e., the sexual plant), and (b) the sporophyte, that is, the spore-producing plant, (i. e., the asexual plant).

There are all told somewhat more than 16,000 species of mosses.

1. **Class Hepaticae**, the liverworts, with mostly bilateral, often flattened, creeping gametophytes, and globose to elongated, mostly spiking sporophytes, usually with "claspers" mingled with the spores. Here are to be found the crystalworts, horned liverworts, great liverworts and scale-mosses.

2. **Class Musci**, the mosses, with multi-lateral, mostly erect, leafy-stemmed gametophytes, and more or less elongated, erect sporophytes, which usually delish by a large lid, and are without "claspers." There are more than fifty families of mosses, among which are species of pea:

mosses, cushion mosses, petioled mosses, bristle-stalk mosses, epheura mosses, wood mosses, hair-cap mosses, bumbleback mosses, tree mosses, bog mosses.

The Ferns (*Pteridophyta*) are much larger land plants than the mosses, to which they are closely allied. They show the same marked alternation of generations, but here the gametophyte is much smaller, sometimes in fact so small as to be actually microscopic, and in all cases it is much shorter lived than the sporophyte. The latter is early provided with roots and leaves, and so becomes quite independent of the gametophyte.

In common ferns the gametophyte is a small, flat, heart-shaped plant, a few millimeters in diameter, and growing attached to the moist soil by the hairs on its lower surface. It bears antheridia and archegones on its lower surface, and after the fertilisation of an egg in one of the latter, a leafy-stemmed and rooted plant (the sporophyte) develops. The fern as we see it is the sporophyte generation, and eventually it produces spores (in common ferns on the lower surfaces of the leaves) which on germination produce gametophytes again.

There are two great types of ferns, namely, the ancient and the modern, including all told somewhat more than 2,500 species.

The Calamites (*Calamophyta*) represent a phylum once very important but now almost extinct. In these plants the gametophyte is much like that of the ferns, while the sporophyte consists of cylindrical, jointed, often hollow stems, rooted below, and bearing narrow, whorled leaves above.

The spores of calamites are borne in whorled sporangia that compose terminal cones upon the stems. When they germinate they produce the small gametophytes referred to above.

There are only about twenty-four species of living calamites, all belonging to the genus *Equisetum* (horsetails).

The Lycopods (*Lepidophyta*) are represented to-day by about 900 species of small plants.

Here we find such living genera as *Lepidodendron* (club-mosses and ground-pines) and *Selaginella* (little club-mosses).

The Cycads (*Cycadophyta*), like the preceding, constitute a phylum from which many types have died out, and what we have left is a mere remnant of a much larger and much more diversified group. In this phylum the gametophytes are very small, so small in fact that they are made small with difficulty even with the aid of the compound microscope, while the sporophyte is large, massive and often of the dimensions of trees. This great difference between the gametophyte and sporophyte generations has obscured the alternation of generations, and this has been emphasised by the fact that the megaspore which gives rise to the archegonial gametophyte does not escape from the sporangium, but remains within it, developing its gametophyte within the sporangium. This retention of the megaspore is the most important step that has been taken in the evolution of this part of the vegetable kingdom, resulting as it does in the better nourishment and greater protection of the gametophyte. This retention of the megaspore necessarily results in the formation of the seed, which appears first in this phylum.

*Development of the Seed.*—The sporangia which produce the microspores are found

upon leaf-like structures (microsporophylls, or "stamens") and these are often aggregated into cones (staminate cones). In like manner the sporangia producing megaspores are on similar leaf-like structures (megasporophylls or "carpels"), and these again are often aggregated into cones (carpellary cones). Moreover, since the megasporangia are to retain the megaspores, they develop an external coat of protective tissue (the "seed coat"). When the megaspore is mature it at once develops a minute gametophyte in which several archegones are produced, each containing an egg. While this development is going on in the megasporangium, the microspore falls out from its sporangium and is carried by the wind to the summit of the young seed, where it germinates and produces a very simple, tubular, antheridial gametophyte, which in turn gives rise to two motile sperms, essentially like those in the preceding phyla.

Upon fertilisation of an egg by a sperm it grows and rapidly develops into a new plant (young sporophyte) within the protective coats, and a little later the megasporangium, with the embryo plant and the surrounding coat, ripens into a "seed." This falls to the ground, and upon the resumption of growth by the embryo the latter soon splits the seed-coat and escapes, sending its root into the ground and its little leaves into the air, and it is henceforth able to maintain itself independently.

There are four or five known classes of cycads, two of which are wholly extinct, and those remaining are mere remnants of larger groups. The living species number between 125 and 150.

The Conifers (*Strobilophyta*) are related to the cycads, but this is in many respects a more modern group. As in cycads so here the archegonial gametophyte is very small, and when it is included in the young seed. The antheridial gametophyte is tubular but the sperms are not motile. The development of the gametophytes and the fertilisation of the eggs and production of the seed are essentially the same in conifers as in cycads. The sporophyte of conifers is much branched, woody, and often developed into enormous trees; the leaves are never large, always simple, and are often narrow or even scale-like, and generally persistent (evergreen). The fact that the megasporophylls and microsporophylls are nearly always in cones (strobili) has given them their common name of "conifers."

About 500 species are known. The principal genera are *Taxodium* (the bald cypress), *Sequoia* (the redwoods), *Arucaria* and *Dammara* (the ancient pines), all of which have many extinct species; *Abies* (the firs), *Picea* (the spruces), *Pinus* (the pines), *Cupressus* (the cypresses), *Thuja* (the arbor vitae), and *Taxus* (the yew tree).

The Flowering Plants (*Anthophyta*) stand as the highest development reached in the vegetable kingdom. The particular structure which is characteristic of this phylum is the flower. This is a modification of the crude structures found in some ancient cycads, and now is typically composed of an axis on which are borne closed megasporophylls above, microsporophylls next lower, and below these one or more whorls of flower-leaves. More particularly, the megasporophylls are not open and more or less flat, as they are in preceding phyla, but as they grow their

edges come together and finally become attached so that the megasporangia are enclosed in the cavity so formed. This structure is known as a "pistil" in ordinary descriptive botany, and the megasporangia with their one or two coats are the young seeds ("ovules"). The microsporophylls (stamens) are much like those of the two preceding phyla, and the microspores themselves are known as "pollen." The flower leaves are typically two whorls, and then the inner whorl is usually more delicate and colored ("petals" composing the "corolla"), the outer whorl is typically of coarser texture and green ("sepals" composing the "calyx"). The principal modifications of the structure of the flower as here given will be indicated elsewhere.

*Fertilization of the Egg.*—The ovule develops as in the preceding phyla, but the archegonial gametophyte is delayed and the egg advanced in the sequence of changes, so that the gametophyte is still quite immature when the egg is ready for fertilization, and it is only after fertilization that it completes its development (as the "endosperm" of the seed). Fertilization is effected as follows: The microspore (pollen) falls upon a particular portion of the external surface of the pistil (the "stigma") and there develops a very simple tubular gametophyte which penetrates the soft stigmatic tissues in the direction of the ovule, which it eventually reaches and penetrates.

In the end of the tube there are now two motile sperm, one of which is passed through to the egg. After fusion of sperm and egg the resultant cell (zygote) divides and subdivides until a new plant is formed. At the same time the development of the belated gametophyte (endosperm) is resumed, the ovule tissues become less watery, the seed coat hardens, and the result is the mature seed.

*Number of Species.*—The flowering plants include an immense number of species, the number now known considerably exceeding 100,000, and with the additions of new species which are constantly being made it is safe to say that the number will eventually reach fully 120,000.

In the development of this vast number some marked modifications of structure have taken place, and these rightly understood give us a clew to the mode and sequence of the evolution, and since taxonomy must follow phylogeny, we have here the key to the classification of these plants.

While it is probable that the embryo plant in the seed of primitive flowering plants had two opposite leaf rudiments, (cotyledons) and hence were dicotyledonous, an early modification appeared in which the embryo had but one leaf rudiment, being monocotyledonous, and this has been adhered to in a group (the monocotyledons) which includes about one-fifth of all the flowering plants.

These may be briefly arranged as follows: The *Monocotyledons* (class *Monocotyledoneae*) have a single cotyledon, alternate leaves which are parallel-veined, and the fibrovascular bundles of their stems are scattered. There are seven or eight orders and nearly fifty families, beginning with the water plantains and their relatives, *Alisma* (water plantain), *Butomus*, *Potamogeton*, etc., in which the pistils are normally three and separate and the other parts of the flower separate also and normally in whorls of three each.

In the lilies the pistils have been reduced to three and these have fused into a single

structure (compound pistil), while the stamens have been reduced to six or three, and the petals and sepals are of three each.

In this central group of the monocotyledons are found such genera as *Lilium* (lily), *Tulipa* (tulip), *Gagea*, *Yucca*, *Asparagus*, *Allium* (onions), *Tradescantia*, *Juncus*, etc.

From the lilies have come at least five other orders by as many modifications of the lily structure. These are the calla lilies, with their crowded, soft, small, lily-like flowers and thick succulent stems and leaves, including *Calla*, *Caladium*, *Calceola*, *Arisaema* (Indian turnip), *Symplocarpus*, *Acorus*, etc., and the reduced duckwoods (*Lemma*).

Next to these are the palms, with small, firm, lily-like flowers and strong, stiff, spreading leaves upon the summit of woody trunks. Here are the date palms (*Phoenix*), cocoanuts (*Coccos*), palmettos (*Sabal*), royal palm (*Oreodoxa*), rattan palm (*Calamus*), etc.

Then come the grasses, with their stiff, leafy stems, and reduced, chaffy flowers of the lily type, including also the sedges with three-ranked leaves and three-angled stems, *Cyperus*, *Scirpus* (rushes), *Carex*, etc. The genuine grasses have two-ranked leaves, borne upon rounded stems.

The genera may be grouped into about a dozen tribes—viz., the bamboos (*Bambusa*), fescues (*Festuca*, *Bromus*, *Poa*, etc.), oats (*Avena*), wheats (*Triticum*, *Hordeum*, *Secale*), grammas (*Bouteloua*, *Buchloe*), red tops (*Agrostis*, *Sporobolus*), canary grasses (*Phalaris*), rice (*Oryza*), panic grasses (*Panicum*, *Setaria*), canes (*Sorghum*, *Saccharum*, *Andropogon*), maize grasses (*Zea*).

In all the foregoing the pistils, whether simple or compound, stand at the summit of the flower axis and are not overgrown or inclosed by any of the other parts of the flower, or the petals or sepals (pistil superior), but in the three following orders such overgrowth has taken place and the pistil is said to be "inferior."

The waterworts (*Hydrals*) include a few water plants, as *Yaltemeria*, *Hydrocharis*, etc.

The lilies include terrestrial, mostly erect plants, with regular and often showy flowers (*Amaryllis*, *Narcissus*, *Agave*, *Iris*, *Ananas* (pineapple), *Musa* (banana), *Zingiber* (ginger), *Conna*).

From this latter order, by the development of "irregularity" in the flower, came the orchids with their odd-shaped flowers adapted to secure the help of insects in the carrying of pollen from flower to flower. Here are *Cypripedium* (lady's slipper), *Orchis*, *Epipactis*, *Vanilla*, *Spiranthes*, etc.

The *Dicotyledons* (class *Dicotyledonae*) have two opposite cotyledons, opposite or alternate leaves which are reticulate veined, and the fibrovascular bundles are arranged in concentric layers in the stem.

The number of species of dicotyledons is probably about four times that of the monocotyledons, and accordingly we find more numerous and much greater modifications of structure in this class, and while the dicotyledons probably appeared earlier in time than the monocotyledons, it is true also that they have attained a higher development. In fact, when we consider the flowering plants as a whole, we are led to the conclusion that the dicotyledons are the typical flowering plants, and that the monocotyledons constitute a nontypical and much less important modification.

The flower of primitive dicotyledons consists of an axis bearing on its terminal portion a considerable number of pistils; below these are whorls of stamens, and still below these the whorls of flower leaves (petals and sepals). Such a flower structure is found in the buttercup and their relatives. From this point of beginning, development has progressed along two main lines, culminating in one case in the mints and in the other in the sunflowers and the dandelions.

**First Line.**—In the buttercup-mint line there are about fourteen orders and 145 families. The more important orders are as follows:

The buttercups (*Ranales*), with all of the flower parts typically free and distinct from one another. Here are such genera as *Myosurus*, *Ranunculus* (buttercups), *Anemone*, *Magnolia*, *Anisima*, *Berberis*, *Nymphaea* (water lilies), etc.

The crucifers (*Rhales*), with the carpels mostly two, and united, as in *Sanguinaria*, *Papaver* (poppy), *Sinapis*, *Brassica* (mustard), *Raphanus* (radish), *Keiske* (mignonette), etc.

The pitcher plants (*Sarraceniales*), *Sarracenia*, *Nepenthes*.

The pinks (*Caryophyllales*), with pistil of three or more united carpels, the petals separate and free, as in *Dianthus* (carnations), *Lycnis*, *Tamarix*, *Salix* (willow), *Populus*, *Portulaca*, *Amaranthus*, *Chenopodium*, *Polypodium*.

The geraniums (*Geraniales*), as in *Geranium* *Oxalis*, *Linum* (flax), *Ruta*, *Citrus* (orange), *Euphorbia*.

The guttifers (*Guttiferales*), as in *Thea* (tea), *Viola*, *Pasiflora*.

The mallows (*Malvales*), as in *Tilia* (linden), *Malva*, *Gossypium* (cotton), *Ulmus* (elm), *Morus*, *Ficus*, *Urtica*, in all of which the petals are free and distinct from one another.

In the following the petals are united (gamopetalous) and there is a gradual reduction in the number of carpels in the compound pistil. The primroses (*Primulales*), as in *Primula* *Dodecatheon*, *Plantago*. The heaths (*Ericales*), as in *Rhododendron*, *Kalmia* *Erica*, *Pirola* *Monotropa*.

The ebony (*Ebenales*), as in *Achras*, *Diospyros* (persimmon), *Styrax*.

The phloxes (*Polemoniales*), as in *Gilia*, *Phlox*, *Convolvulus* (morning glories), *Solanum*, *Capiscum*, *Datura*.

The gentians (*Gentianales*), as in *Olea* (olive), *Fragaria* (ash), *Gentiana*, *Asclepias*. The figworts (*Scrophulariales*), as in *Verbena*, *Gerardia*, *Catalpa*, *Orobancha*, *Utricularia*, *Acanthus*.

The mints (*Lamiales*), as in *Verbena*, *Nepeta*, *Lamium*, *Salvia* (sage), *Mentha* (mint).

These plants are at the summit of this line, and represent the highest development attained by plants with gamopetalous flowers whose pistils are superior.

**Second Line.**—In the rose-sunflower line there are about nine orders and eighty-nine families, the general sequence of which is as follows:

The roses (*Rosales*) are very much like the buttercup, having usually a considerable number of simple pistils, many stamens, and petals and sepals not united. The flower axis has a disk-shaped enlargement at its base, and this appears to be the dominant structure of this line. Here are such genera as *Potentilla*, *Fragaria* (strawberry), *Spiraea*, *Rosa*, *Pirus* (apple), *Prunus*, *Mimosa*, *Gleditsia*, *Trifolium*, *Medicago*, *Vicia*, *Pisum* (pea), *Saxifraga*, *Ribes*, *Crassula*, *Plantago*.

The myrtles (*Myrtiales*) have overgrown the compound pistil by the cup-shaped disk, as in *Myrtus*, *Jambosa* (clove), *Eucalyptus*, *Oenothera*, *Fuchsia*.

The cactuses (*Cactales*) have, in addition to myrtle-like flowers, a leafless, fleshy plant body, as in *Opuntia*, *Cereus*, *Cactus*, *Melocactus*, etc.

The loasas (*Loasales*) include such genera with inferior pistils as *Mentzelia*, *Cucurbita* (pumpkins), *Cucumis* (melons), *Citrullus*, *Begonia*.

The buckthorns (*Celastrales*) include *Rhamnus*, *Vitis* (grapes), *Celastrus*, *Ilex* (holly), *Elaeagnus*, *Viscum* (mistletoe), etc.

The horse-custards (*Sapindales*), which include a series of trees with more and more simplified flowers, from *Esculus*, *Acer* (maple) and *Rhus*, to *Juglans* (walnuts), *Betula* (birch), *Corylus*, *Fagus* (beech), *Castanea* (chestnuts), and *Quercus* (oaks).

The umbellifers (*Umbellales*), in which the mostly bicarpellary two-celled pistil is wholly inferior by the adhesion of the disk, and the five stamens and five petals are distinct, while the sepals are small. Here we find *Aralia*, *Hedera* (ivy), *Coriandrum*, *Conium*, *Cicuta*, *Pastinaca*, *Daucus* (carrot), *Cornus*, etc.

The madderworts (*Rubiales*), with the general structure of the umbellifers but with the petals united (gamopetalous), represented by *Galium*, *Coffea*, *Chinchona*, *Sambucus*, *Lonicera* (honeysuckle), etc.

The sunflowers (*Asterales*), with small flowers, mostly crowded into heads, the pistil typically bicarpellary but mostly one-seeded and one-celled, the corolla tubular and the calyx reduced to chaff or bristles (pappus) or entirely wanting. Here at the summit of the vegetable kingdom are found the bellworts (*Campanula*) and lobelias (*Lobelia*) and also a vast number of "composites," of which more than 13,000 species are now known. These represent the highest development to be found anywhere in the vegetable kingdom.

The sunflowers proper (species of *Helianthus*) are to be regarded as representing the lower or primitive composites, from which have come the ragweds (*Ambrosia*), as well as the asters (*Aster*) and golden-rods (*Solidago*) and ironweeds (*Veronica*) on the one hand, and the chrysanthemums (*Chrysanthemum*), groundels (*Senecio*), Arnica, thistles (*Cnicus*), the chicories (*Cichorium*), the lettuce (*Lactuca*) and the dandelions (*Taraxacum*).

The last-named genus is on many accounts to be regarded as the highest in this group, and as a consequence, in the vegetable kingdom.

**Bibliography of Botany.**—Only the most important works are here enumerated.  
**History.**—Green's *Landmarks of Botanical History*; Bach's *History of Botany*, 1580-1860; Green's *History of Botany*, 1860-1900.

**Cytology, Histology, Morphology.**—In addition to the ordinary text-books consult Strasburger, Noll, Schimper, and others.

**Physiology.**—Pfeffer's *Physiology of Plants*.  
**Pathology.**—Ward's *Diseases in Plants*.  
**Ecology.**—Clausen's *Research Methods in Ecology*.

**Phytogeography.**—Schimper's *Plant Geography*.  
**Phylogeny, Taxonomy.**—Campbell's *Evolution of Plants*; Engler's *Charakter über die Unterabteilungen*; Rastbach's *Die Pflanzenwelt*; Engler's *Phylogenie und Erläuterungen zur Übersicht*; Bonnier's *Synopsis of Plant Phylogeny*; Engler's *Phylogenie und Systematik*; Engler's *Phylogenie und Systematik*.

**Nomenclature.**—International Rules of Botanical Nomenclature adopted by the International Botanical Congress, Vienna, 1891.  
For the systematic botany of the whole vegetable kingdom consult Engler and Prantl's *Naturlicher System der Pflanzenwelt*; Engler's *Phylogenie und Systematik*; Engler's *Phylogenie und Systematik*; Engler's *Phylogenie und Systematik*; Engler's *Phylogenie und Systematik*.

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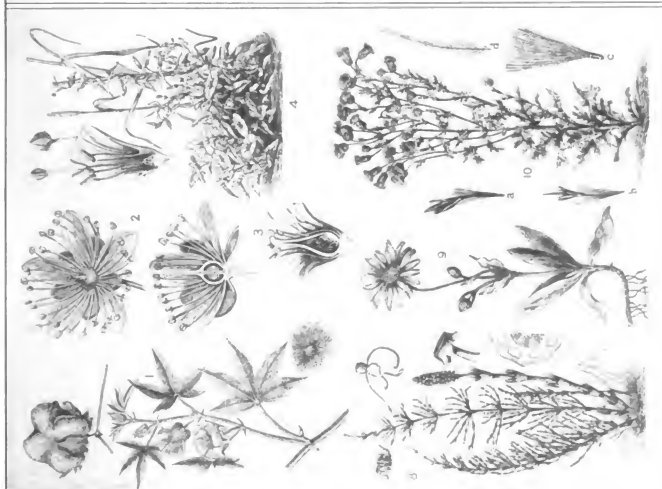
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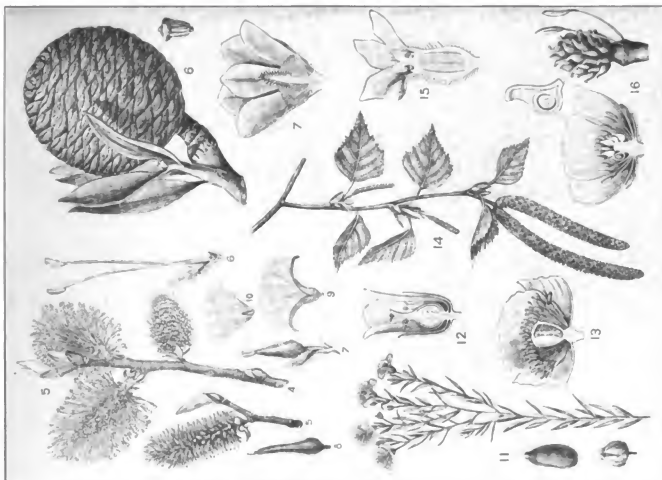
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1 Cotton (*Gossypium*): fruit and seed.  
2 Tobacco (*Nicotiana glauca*): flower section.  
3 Tobacco (*Nicotiana glauca*): fruit section.  
4 Morning glory (*Ipomoea*): flower section, fruit and seed.

5 Willow (*Salix*): 4, 5, 6, 7, 8, 9, 10, flowers and seed.  
6 Willow (*Salix*): flower section.  
7 Magnolia (*Magnolia*): flower section.  
8 Field Horsetail (*Equisetum arvense*): plant form.  
9 Arisea (*Arisea*): stem, leaf and flower.



10 Thistle (*Cirsium*): flowers and bristles.  
11 Thistle (*Cirsium*): fruit and seed.  
12 Monarda (*Monarda*): flower section.  
13 Poppy (*Papaver*): flower section.

14 Birch (*Betula*): flowers.  
15 Birch (*Betula*): flower section.  
16 Birch (*Betula*): section of flower, pistil, stamens, ovule, etc.





- 1 *Cornus*, (a) leaf with rac, (b) eye flower, (c) pink flower, (d) head of tubular flower.  
 2 *Galearia*, flower.  
 3 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.  
 4 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.  
 5 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.  
 6 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.



- 1 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.  
 2 *Galearia*, flower.  
 3 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.  
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 5 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.  
 6 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.  
 7 *Galearia*, flower.  
 8 *Cornus*, (a) pistillate, (b) staminate flower, (c) fruit.

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 English.—*Annals of Botany*; *New Phytologist*.  
 German.—*Flora*; *Berichte der Deutschen Botanischen Gesellsch.*; *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie*; *Jahrbücher für Wissenschaftliche Botanik*.  
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**CHEMISTRY** is that science which is largely concerned with a study of the different species of matter and of the changes from one species to another. When iron rusts, or when charcoal burns, the products of these chemical changes are species of matter that are different from the original iron or charcoal. The different species or kinds of matter are called *substances*. Granite, and also gunpowder, are mixtures of at least three different substances.

Substances are recognized and identified often by their *physical properties*, such as color, density, boiling point, melting point, and solubility. They can also be recognized by their *chemical properties*, such as combustibility, ease of rusting, or, generally, their *chemical reactions* or behavior toward other substances chosen to test them with.

**Pure Substances.**—In studying the different kinds of matter (different substances), such as iron, charcoal, salt, sugar, or niter, it is necessary to first prepare them in a pure state. To do this the chemist uses various processes. In *filtration* the insoluble solid matter is retained by a piece of unglazed filter-paper, while the liquid passes through the paper and is collected as the *filtrate*. Instead of filter paper, unglazed earthenware may be used to filter drinking water. The pores in this are so small (in Pasteur filters) that even the minute microbes, some of which cause disease, cannot pass through.

In *distillation* a liquid, by raising its temperature, is converted into gas and is so separated from any substances that accompany it which are less volatile, i. e., less easily gasified. In this way, for example, pure drinking water may be obtained on board ship from sea water, which contains difficultly volatile salts, including common salt, dissolved in it. The gaseous water (steam) is condensed to water again by passage through a cooling tube. It should be noticed that the changes from water into steam and vice versa are classed as *physical changes*, because analysis shows that steam and water consist of the same substance differing only in state, steam being in the gaseous state, water in the liquid, and ice in the solid state.

*Sublimation* refers to the distillation of solids. Sal-ammoniac, benzoic acid, etc., are purified by sublimation. *Lixivation* and *leaching* refer to the dissolving out of a soluble substance from its admixture with an insoluble substance.

**Physical Properties.**—The substance having been obtained in a pure state, a study may be made of its properties. Purity is extremely important; and chemists and

physicists alike have in the past often wasted years of their lives in studying substances that were seriously impure and that could not, therefore, be expected to yield constant results.

**Solubility.**—Among physical properties, solubility is one of the most important to the chemist. Liquids dissolve solids, other liquids, and also gases. If common salt be added to water, it dissolves, and, after stirring, the solution is said to be homogeneous because all samples, wherever taken, prove to be identical. Water is here the *solvent* and salt the *solute*. If more and more salt be added by degrees, the temperature remaining constant, a stage is finally reached at which the solution will take up no more salt. The solution is then said to be *saturated*, at that temperature, with common salt.

Its *concentration* may be stated in any one of three ways: (1) weight of salt contained in such a volume of the solvent; (2) weight of salt contained in such a weight of the solution; (3) weight of salt contained in such a volume of the solution. When the temperature is raised it is found that the solution can take up more salt. Tables of solubilities state the concentration of the saturated solution at a series of different temperatures. It is by making use of their differences in solubility that intimate mixtures of different solids can be separated into their components; for instance, radium bromide is separated from barium bromide by repeated *fractional crystallization*.

Most, but not all, solids are more soluble at higher temperatures than at lower. All substances seem to be slightly soluble in water, although in some cases the saturated solution is an exceedingly dilute one.

That gases dissolve in water is known to every one who has examined *soda-water*, which contains the gas carbon dioxide in solution. If the gas is under pressure, the weight of it that the solvent will dissolve is proportional to the pressure (Henry's law). Since *soda-water* is aerated at several atmospheres' pressure, a portion of the gas tends to escape when the pressure is released. Gases are less soluble the higher the temperature, and can often, though not always, be completely removed by boiling the solvent. By ten minutes' boiling, for example, the gases dissolved from the air by ordinary water may be removed and the water thus rendered flat or insipid to the taste.

**Molecular Hypothesis.**—In studying the physical properties of substances there is a hypothesis as to the structure of matter—the kinetic-molecular hypothesis—that has proved particularly illuminative. On this hypothesis each substance is supposed to be built up of minute particles of its own material called *molecules*, all alike and each incapable of finer subdivision if the substance is to remain the same. In the gaseous state of the substance the molecules are at distances apart that are great in comparison with their own diameter, and are moving about in straight lines with great speed, each occasionally colliding with some other molecule or with the walls of the vessel. The miniature bombardment of the walls of the vessel by myriads of molecules is the cause of the pressure of the gas on the walls.

**Boyle's Law.**—In agreement with this conception is the well-known fact that if a gas be compressed to  $\frac{1}{2}$  times its original volume, then its pressure is increased n-fold. For,

plainly, the molecules, and therefore their impacts, will now be n-times as many as before. It is also a well-known fact of experiment that the pressure of an inclosed volume of gas varies directly as its absolute temperature, i. e., its temperature measured from the absolute zero, which is  $-273^{\circ}\text{C}$ . This is accounted for by considering that the speed of motion of the molecules is increased as the temperature rises, and that the impacts of the molecules are therefore stronger. It is indeed strange that gases should all be precisely alike in conforming to these two laws, for in the case of solids and of liquids the behavior toward pressure and toward change of temperature is different for each substance. Gases must, therefore, all have something in common which liquids and solids have not.

It seems certain that all gases contain, at like temperature and pressure, the same number of molecules in equal volumes. Since this is so, by weighing equal volumes of different gases the relative weights of their molecules can at once be found. The *molecular weights*, compared with the weight of a molecule of oxygen taken as 32, of gases, or of gasifiable substances, are determined in this way.

**Vapor Pressure.**—In the case of liquids, the crowding together of the molecules is much closer than in gases. If a gas be at a temperature lower than its *critical temperature*, however, it may always be compressed into a liquid. From the surface of a liquid, supposed to be placed, for example, in an empty closed vessel, some of the molecules are constantly escaping into the upper part of the vessel, where they behave like gas molecules, giving rise to a (gaseous) pressure there, known as the *vapor pressure* of the liquid. Some of the vapor are constantly returning to the liquid, because of the course of their wanderings, but their places are taken by newcomers from the liquid. The vapor pressure, therefore, remains constant at any temperature. If the temperature is raised, this vapor pressure increases. For this reason, water in such a vessel, if raised sufficiently in temperature, might finally "burst its boiler."

**Chemical Analysis.**—The chemical properties of pure substances may be studied by testing by experiments their behavior under different conditions, both alone and toward other substances. In particular it may be discovered, for example, that red lead can be made to furnish the metal lead and the gas oxygen. The processes of finding out what substances or mixtures of substances are made up of are called *chemical analysis*.

**Qualitative Analysis** concerns itself with the kinds of matter present, and *quantitative analysis* with the proportions by weight or by volume in which they are present. It has been found that all substances are made up from only about eighty-two different kinds of matter, called *elements*, combined in different ways. These elements are, for example, carbon, hydrogen, oxygen, nitrogen, sulfur, phosphorus, iron, calcium, etc. Some compounds are so different, each contains only the three elements, carbon, hydrogen, and oxygen in different proportions. All compounds containing only oxygen in combination with one other element are called *oxides*, as calcium oxide (quicklime), lead oxide (litharge). Those compounds containing chlorine in combination with one other element are chlorides, as sodium chloride (common salt), etc. In general, compounds with the termination *ide* contain only the elements named. Those, whose names end in *ite* contain, besides oxygen, as sodium chlorite; those ending

in *etc* more oxygen still, as sodium chlorate, while sodium perchlorate contains still more oxygen than sodium chlorate. The majority of the elements are metallic elements (metals), while only about fourteen are nonmetallic elements (carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, chlorine, silicon, *etc.*).

**Quantitative Analysis** has brought out many of the most remarkable facts of chemistry that were entirely missed by the chemists of antiquity and of the middle ages. It is found, by weighing, that no matter *case* be destroyed, although one compound may be changed into another. This principle is called the *conservation of matter*. A candle appears to burn to nothing merely because its products of combustion happen to be invisible. If it be allowed to burn in a large closed vessel, there is just as much carbon in the vessel after as before the burning, although it is now in the form of a gas (carbon dioxide) instead of combined as a solid compound with hydrogen.

Quantitative analysis of different samples of the same pure substance brings out the fact that the composition of every pure substance is invariably the same, or, in other words, that the elements combine in definite proportions by weight to form each particular compound. This observed regularity is known as the *law of definite proportions*. By analysis of different compounds made of the same elements, A and B, it is found, further, that the weights of B, which, in the different compounds, are united with the same weight of A, are related to each other in the ratio of small integers. This could not have been anticipated, and, when found, calls for explanation. The accepted explanation is most concrete in terms of the atomic theory.

The **Atomic Theory** supposes that the molecules of every compound are built up of units, called atoms, of the elements that are present, and that all the atoms of any one element are identical in material and weight. Thus, a water molecule consists of molecules each of which contains two atoms of the element hydrogen combined with one atom of the element oxygen. Symbols are given each element to stand for the weight of its atom compared to the weight of an atom of oxygen, which is taken as 16 (for arbitrary reasons of convenience). The formula for a molecule of water is thus  $H_2O$ , signifying that one atomic weight of oxygen (16 parts by weight) is combined with two atomic weights ( $2 \times 1 = 2$  parts by weight) of hydrogen. The formula for hydrogen peroxide is  $H_2O_2$ .

It will be seen upon reflection that this atomic hypothesis accounts perfectly for the experimentally found law of multiple proportions referred to above, as well as for the observed fact (*law of combining weights*) that the proportions by weight in which elements combine to form compounds can always be expressed perfectly by (usually) small integral multiples of particular numbers, one number belonging to each element.

**Combustion.**—A Christmas candle will burn less than ten seconds is half a pint of air. A kerosene lamp with a good Rochester burner will burn not more than four minutes in an empty flour barrel if tightly covered. The burning of the wax or the oil consumes a portion of the oxygen which constitutes one-fifth of the air, and they cease to burn when one-quarter of the oxygen, or one-twentieth of the air,

is used up. Air which contains not more than 15 per cent oxygen will extinguish a fire; it will also extinguish life. Hence a lantern is lowered into old wells to determine whether it would be safe for a man to descend into them. The air which comes from one's lungs is very nearly like that left in the barrel after the lamp had extinguished itself in it. A bottleful of air from the lungs will extinguish a candle flame.

**Formation of Compounds.**—Fuels in burning unite with the oxygen of the air, forming new compounds. For example, when we burn in an ordinary furnace fifteen tons of coal, the furnace consumes also about thirty-two tons of oxygen from the air, and pours out into the air about forty-four tons of carbon dioxide gas, leaving behind about three tons of ashes. These figures, although not exact, are intended to convey two ideas—first, that combustion is a union of oxygen with fuels; and, second, that the process neither destroys nor creates matter, but merely changes combinations of matter. The oxygen is quite as much fuel as the coal.

In the case of the coal, the kerosene or the candle, water vapor is produced as a product of combustion along with the carbon dioxide. This water vapor is noticed when a cool chimney is first put upon a kerosene lamp.

**Fuels and Foods.**—Our foods correspond to fuels and we take in also oxygen as a food, or fuel. By a process analogous to combustion we cause oxygen to unite with these foods, producing water vapor, carbon dioxide, and heat for our bodies.

When a bottle of pure oxygen is placed over a burning candle the candle of course burns brighter and longer than it would in a bottle of air, but goes out before all the oxygen is exhausted. The contents of the bottle will now act as a fire extinguisher, although it contains as much oxygen as ever. Part of the oxygen is now bound in chemical union with carbon in the candle, and the oxygen which is free does not constitute a sufficiently large portion of the whole to support combustion.

**Rust.**—As might be expected, many things burn vigorously in pure oxygen which burn but slowly or not at all in the air, since the air is greatly diluted oxygen. A thin strip of iron may be burned with great vigor in pure oxygen. The black substance which will be found on the bottom of the bottle after the close of this experiment is analogous iron rust. It weighs considerably more than the iron which was burned and the increase in weight represents the oxygen which was burned. Combustion and rusting differ only in the rapidity of the action. Combustion is rapid rusting, and rusting is slow combustion. Both are called oxidation and the products are called oxides. The oxidation of our foods in our bodies is slow—more like rusting than combustion. We cover iron with various things to prevent the oxygen of the air from rusting it. It is covered with tin in the tinware of the kitchen, with zinc in the case of "galvanized" iron, with a slick, with porcelain, with paint, with grease, with vasoline, *etc.*

**Extinguishing Fires.**—In fighting a fire at its start, the one thing to do is to make the fire smother itself. An ordinary living room does not contain oxygen enough to burn up five pounds of wood. If the doors and windows are closed perfectly tight, a fire burning in a pile of dry kindlings in such a room will smolder for a time and

finally go out precisely as does the candle burning in a bottle.

Most fire extinguishers are devices for producing carbon dioxide gas. With this they smother small fires by pouring into the atmosphere around them enough of the gas to reduce the proportion of oxygen below 15 per cent.

Streams of water, when thrown in sufficient quantity, as by fire engines, extinguish large fires both by cooling the fuel and by diluting the air with steam until the proportion of oxygen falls below 15 per cent.

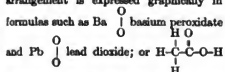
**Atomic Weight.**—The choice of atomic weights is a matter of some little complexity. The atomic weight of an element is defined to be the smallest of the weights of the element found in the molecular weights of all its volatile compounds. To pick out the correct atomic weight for the element chlorine, for instance, the molecular weights of all the volatile compounds of chlorine must first be found. Next, to find out what part of the molecular weight of each compound is due to chlorine, each of the compounds must be analyzed. Thus a series of analyses is arrived at which might read as follows: 41, 100.5, 71, 35.5, 142, 35.5, 71, *etc.* From this it is seen that the smallest weight of chlorine occurring in any of these compounds is, on the scale used, 35.5. Since no compound is found to contain in its molecular weight a smaller weight of chlorine than this, 35.5 is adopted as the molecular weight of chlorine. It should be noted that the formula for the gas chlorine is  $Cl_2$ , because its molecular weight is found by experiment to be 71, and must therefore contain two atomic weights of chlorine.

The case is more difficult when we have to deal with an element that forms few volatile compounds. In such cases, we are aided by a regularity, or law, first observed by the French chemists Dulong and Petit in 1819, that the numerical product of the atomic weight of an element by its specific heat is usually close to 6.3. When in doubt between several plausible values for the atomic weight of an element, we may, therefore, settle the question by determining its specific heat and then selecting for atomic weight that value which will yield a product near to 6.3 when multiplied by the specific heat observed.

**Valence.**—If one examines the formulas for a number of different chlorides, as  $NaCl$ ,  $MgCl_2$ ,  $AlCl_3$ ,  $CCl_4$ ,  $PCl_5$ , it is evident that the atoms of sodium, magnesium, *etc.*, seem to differ in their power of holding chlorine atoms. Sodium, as also chlorine, is said to have a valence one; magnesium two; aluminum three; carbon four; and phosphorus five. The valence of oxygen is two, and the formulas for the oxides corresponding to the above chlorides are  $Na_2O$ ,  $MgO$ ,  $Al_2O_3$ ,  $CO_2$ ,  $P_2O_5$ . Thus two atoms of aluminum with their total of six valence "bonds" are found united with three atoms of oxygen, which also have, in all, six valence bonds. Many elements can function, under different conditions, with two or even more valences; thus iron in one series of compounds is dyad or bivalent, as in  $FeCl_2$ ,  $FeO$ , *etc.*; and in another series triad or trivalent, as in  $FeCl_3$ ,  $Fe_2O_3$ , *etc.* Phosphorus is triad in  $PCl_3$ , but pentad in  $PCl_5$ .

**Graphic Formulas.**—There are often good reasons for assigning certain arrangements of the atoms within the molecule. This

arrangement is expressed graphically in



acetic acid, the simple formula for which is  $\text{C}_2\text{H}_4\text{O}_2$ .

**Space Formulae.**—Pasteur was the first to study certain pairs of substances whose molecules contain atoms of precisely the same elements arranged precisely similarly, but with only this difference, that the molecules of the two "enantiomorphous" substances are related to each other as a right-hand glove is to a left-hand glove, or as an object is to its mirror-image. Such molecular arrangements can be imitated accurately by models in space of three dimensions.

**Reactions.**—Chemical reactions are represented by means of equations. Thus, the fact that 66 parts of iron will unite with 32 parts of sulphur to produce 88 parts of ferrous sulphide is written  $\text{Fe} + \text{S} = \text{FeS}$ . Again the equation  $4\text{Al} + 3\text{O}_2 = 2\text{Al}_2\text{O}_3$  indicates, if the atomic weights be known, the respective weights of aluminium and of oxygen that react to form a certain weight of aluminium oxide. This is a case of simple combination.

A more complex reaction, which takes place in solution, is shown by the equation  $\text{AgNO}_3 + \text{NaCl} = \text{AgCl} + \text{NaNO}_3$ , where we find the four "radicals"  $\text{Ag}$ ,  $\text{NO}_3$ ,  $\text{Na}$  and  $\text{Cl}$  exchanging partners. Such a change is called a *double decomposition*. A group of atoms such as  $\text{NO}_3$  that remain together throughout a series of reactions is called a *compound radical*.

Radicals are classified into *positive* and *negative* radicals. In the above example,  $\text{Ag}$  and  $\text{Na}$  are each positive, while  $\text{Cl}$  and  $\text{NO}_3$  are negative radicals. A compound containing both kinds of radicals is a *salt*—for example, silver nitrate, silver chloride, sodium nitrate, sodium chloride.

Those salts that have hydrogen for their positive radical are called *acids*, and their solutions have a sour taste and turn the blue coloring matter litmus red. Those salts that have the group  $\text{OH}$  for their negative radical are *bases*, and their solutions have a soapy taste and feel, and turn red litmus blue; for example, sodium hydroxide. When an acid is mixed with a base in solution, the radicals  $\text{H}$  and  $\text{OH}$  combine to form water  $\text{HOH}$ , and the remaining positive and negative radicals, on uniting, constitute a salt. If the resulting solution has no action on litmus, the acid and base have "neutralized" each other.

Salts may also be formed in the dry way by the union of an "acidic oxide" such as carbonic anhydride with a "basic oxide" such as calcium oxide,  $\text{CO}_2 + \text{CaO} = \text{CaCO}_3$ . The oxides of the nonmetals are acidic, while the lower oxides of the metals are basic. The higher oxides of the metals, *i. e.*, those with more oxygen, are frequently acidic. An acidic oxide yields an acid when it combines with water, while a basic oxide yields a base.

Besides involving changes from one form of matter to another, all chemical reactions are accompanied by some energy change. Heat, light, mechanical or electrical energy may be produced or consumed. The corresponding branches of chemistry that deal with such energy changes are *thermochemistry*, *electrochemistry*, *photochemistry*, etc.

**Thermochemistry.**—(1.) If the parts taken be grams, the above mentioned reaction

between aluminium and oxygen gives rise to 760,400 calories of heat. This is expressed by the thermochemical equation  $4\text{Al} + 3\text{O}_2 = 2\text{Al}_2\text{O}_3 + 760,400\text{cal}$ . This particular reaction has been chosen as an example because of its technical importance. Few other metals in combining with oxygen produce nearly so much heat as aluminium. Thus, for the burning of iron the thermochemical equation is  $4\text{Fe} + 3\text{O}_2 = 2\text{Fe}_2\text{O}_3 + 388,800\text{cal}$ . Now if aluminium filings are mixed with iron oxide and the mixture ignited, the aluminium deprives the iron of its oxygen, as shown by the equation  $2\text{Al} + \text{Fe}_2\text{O}_3 = \text{Al}_2\text{O}_3 + 2\text{Fe} + 185,800\text{cal}$ , and the amount of heat liberated is the difference between the heat supplied by the combination of aluminium with oxygen and that consumed in the decomposition of the iron oxide, *etc.*,  $(760,400 - 388,800) + 2 = 185,800$ . Since the materials are in close admixture, the reaction proceeds rapidly, and, as no volatile products are formed, no heat is thus carried away. A very high temperature is produced and may be utilized for welding rails, etc. (Goldschmidt process).

(2.) It is sometimes necessary, on the other hand, to produce a very high temperature before a chemical action will take place. In addition to the ordinary types of furnaces, electric furnaces have latterly been used for this purpose, their exceedingly high temperatures rendering possible the manufacture on a commercial scale of calcium carbide, carborundum, silicon, "electrical steel," artificial graphite, etc., thus giving rise to many industries which were not dreamed of before the advent of this type of furnace.

**Electrochemistry.**—A study of chemical reactions in their relations to electrical energy has developed enormously within the last twenty years.

(1.) Many chemical reactions may be so conducted as to furnish a supply of electricity. Such reactions are allowed to take place in primary batteries, *e. g.*, in the Daniell cell, Leclanché cells, and in a secondary cell, such as a lead accumulator, a chemical action is caused to take place by putting in electrical energy from the dynamo. When this reaction is complete, the cell is "charged"; and whenever the reaction is allowed to reverse itself, electricity will be given out.

(2.) There are many reactions which can be made to occur by the use of electrical energy. For example, salts, whether fused or in solution, may be decomposed by electrolysis. Thus gold, silver, nickel, copper, etc., may be deposited from solution of their salts (*q. d.* gold, etc., plating, electrotyping, etc.). Solution of common salt may yield on electrolysis sodium hydroxide, chlorine, sodium hypochlorite and sodium chlorate, all valuable products. Copper is refined electrolytically. The metals sodium, potassium, magnesium, calcium, aluminium, etc., are produced commercially by electrolysis of their molten compounds.

Electrical energy may also be used to produce electric discharges in which such actions as the making of ozone, nitrogen peroxide (and hence nitric acid) may be caused to take place. The latter application may prove of vast importance in the near future, when the world's supply of Chili saltpeter ( $\text{NaNO}_3$ ), upon which, as a nitrogenous nutrient, the wheat supply in particular depends, is exhausted.

**Photochemistry** finds its chief application in the field of photography. The efficiency of various mixtures of the earths

ceria and thorium in incandescent gas mantles, or of titanium carbide as a substitute for the carbons of arc-lamps, are really questions of physics, but have obviously a close connection with chemistry. **Physical Chemistry** includes besides the three branches just referred to that deal with the energy changes accompanying chemical reactions, the study of many other topics that are closely related to physics. This side of chemistry has developed in a quite phenomenal degree since the year 1887, in which the ionic theory was first propounded.

**Ionic Theory.**—According to the ionic theory, when salts are dissolved in water they are largely split up into their radicals, which are then present in the solution carrying electric charges. These charged radicals are called ions. Thus, the ions furnished by common salt in solution are  $\text{Na}^+$  and  $\text{Cl}^-$ , where the positive and negative charges on the ions are indicated by a '+' and a '-' respectively.

In a solution containing 58 grams of common salt per liter, 68 per cent of the molecules of sodium chloride are considered to be ionized, while the remaining 32 per cent remain in the form of unbroken molecules. It must be remembered that the ion  $\text{Cl}^-$  is not by any means the same substance as the gas chlorine, for, though it is made of the same kind of matter, its energy content is very different. The ions in a solution of sodium sulphate ( $\text{Na}_2\text{SO}_4$ ) are  $\text{Na}^+$ ,  $\text{Na}^+$ , and  $\text{SO}_4^{--}$ .

In alcoholic solution, salts are not so highly ionized as in water; that is, the proportion of un-ionized (or undissociated) molecules is larger. In solution in other liquids, salts are often scarcely ionized at all, and it is found that such solutions do not conduct electricity as aqueous solutions of the same salts do.

The mechanism of the (electrolytic) conductivity of a solution of a salt, acid, or base in water consists, on the ionic hypothesis, in a bodily attracting of the positive ions in the solution by the negatively charged pole, and of the negative ions by the positive pole immersed in the solution. The positive and negative ions, therefore, move or travel toward the electrodes or poles, and finally give up their charges there. In this way electricity is transported through the solution.

In terms of the ionic theory, an acid owes its acid properties to the presence of hydrogen-ion in its solution, while a base owes its basic properties to the presence of hydroxide-ion ( $\text{OH}^-$ ). The strongest acids and bases are those that under like circumstances yield the highest concentration of  $\text{H}^+$  and  $\text{OH}^-$  respectively.

**Subdivisions of Chemistry.**—In its treatment of the various forms of matter, chemistry divides itself into the two great branches of inorganic and organic chemistry.

**Organic Chemistry.**—The latter is so-called because it originally dealt with the substances that are found in the organic vegetable and animal kingdoms. Practically most of these substances contain carbon, so that organic chemistry is nowadays the chemistry of the carbon compounds. As the number of known organic compounds is well over 100,000, the subject is a large one, with a very voluminous literature, increasing year by year in yearly as well as in total volume.

**Carbon.**—The valence of carbon in most of its compounds is uniformly 4, a regularity which simplifies matters con-

siderably at the outset. Carbon atoms are found to have the faculty of linking themselves together to form chains and rings. In this faculty carbon is exceptional among the elements, and for this reason no other element approaches carbon in the multitude of its compounds, so as to merit the treatment of its compound as a separate branch of chemistry. The attaching of carbon atoms to each other does not utilize all four of the available valences, and the unoccupied valences are therefore able to attach to the molecule such other elements as hydrogen, oxygen, nitrogen, etc.

It is found that the same grouping of elements recurs as part of a complex molecule; and all substances that possess the same group somewhere in their molecule are fortunately found to show the same reactions in virtue of the presence of that group. Thus all the compounds containing the group  $\text{—CH}_2\text{OH}$  are classed as primary alcohols; those with the group  $\text{—CHO}$  are aldehydes; those with  $\text{—COOH}$  are acids;

those with the group  $\text{—C=}$  attached to carbon atoms on both sides, are ketones;

and so on. The fact that all primary alcohols, all aldehydes, acids, etc., behave chemically more or less alike makes it possible to bring order out of the chaos of organic compounds, since the chemical groupings of atoms are comparatively few in number.

**Hydrocarbons.**—Many important organic compounds contain only the elements carbon and hydrogen. These are called the *hydrocarbons*, and include marsh gas ( $\text{CH}_4$ ), acetylene ( $\text{C}_2\text{H}_2$ ), benzene ( $\text{C}_6\text{H}_6$ ) and the components of rock oil, which is a mixture of many hydrocarbons.

**Carbohydrates.**—Another set of organic compounds contains only the three elements carbon, hydrogen and oxygen, the latter two in the same proportion as in water, viz., two atoms of hydrogen to one of oxygen. These are the *carbohydrates*, and include grape and fruit sugars ( $\text{C}_6\text{H}_{12}\text{O}_6$ ), cane, malt and milk sugars ( $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ ), the starches and cellulose [ $(\text{C}_6\text{H}_{10}\text{O}_5)_n$ ], which last is the structural material of the vegetable world. The fats and oils, common alcohol, glycerine, and acetic, citric and tartaric acids contain only carbon, hydrogen and oxygen.

When to these elements is added nitrogen as a possible constituent of organic substances, the list becomes a very varied one, including nitroglycerine, nitrocellulose or gun cotton, aniline and a host of dyes, and most of the alkaloids—substances of very powerful physiological action that occur in plants. Adding also sulphur, the vastly important proteins are included, some of which (the nucleoproteins) may contain also phosphorus. Other than water, fats and mineral constituents, proteins constitute the building material of the animal body, and are necessary in the diet of animals.

**Inorganic Chemistry**, deals with over eighty different elements and their compounds, including those of the mineral world. Its extent is in part indicated in the subjoined table of *Chemical Elements*.

The selection and grouping together of the facts and principles of chemistry that bear on some particular topic gives rise to such divisions as "physiological chemistry," "agricultural chemistry," "biochemistry," "immunology," etc. Such titles are, for the most part, self-explanatory.

## CHEMICAL ELEMENTS

Tabulation of facts concerning all the known elements.

At. wt., atomic weight; S. G., specific gravity; M. P., melting point; B. P., boiling point; C. T., critical temperature.

NAME, WITH CERTAIN DATA	OCCURRENCE AND PREPARATION	PROPERTIES	CHIEF COMPOUNDS AND USES
<b>Aluminium.</b> Symbol Al. At. wt. 27.1. Valence III. S. G. 2.5. M. P. 658°.	Occ.—cryolite $\text{AlF}_3 \cdot 3\text{NaF}$ , bauxite, impure $\text{Al}(\text{OH})_3$ in feldspars, micas and clays, emery, ruby, sapphire ( $\text{Al}_2\text{O}_3$ ). Prep., com'l., by electrolysis of $\text{Al}_2\text{O}_3$ from bauxite, dissolved in cryolite, water-power usually furnishing the electrical energy.	Silver-white, ductile, malleable at 120°, tensile strength (rolled) 16 tons per sq. in. A better conductor of electricity, weight for weight, than copper. Molten metal not cast by itself, but is cast in sand, or turns badly in the lathe. Acted upon by dil. hydrochloric acid, slowly by sulphuric, but not by nitric or the weaker organic acids in foods. Soluble in alkaline hydroxides. The tarnishing action of moist air soon comes to an end as the tarnish acts as an adherent protective coating.	Used for cooking utensils, boat-building, military accoutrements and small articles requiring lightness and strength; for electric leads. The powdered metal is used as a body for paints; and its mixture with ferric oxide, called thermite, is used for producing very high temperatures (up to 3700°) in the welding of metals. Aluminums are reduced from their oxides by means of Al, hence its use in casting steel. Aluminium is about 10% of alloys, with a tensile strength of 40 tons per sq. in. Its sulphate forms alums, e.g., $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ , common alum.
<b>Antimony.</b> Symbol Sb. At. wt. 120.2. Valence III and V. S. G. 6.7. M. P. 630.7°. B. P. red heat.	Occ.—free, and as stibnite ( $\text{Sb}_2\text{S}_3$ ). Prep.—roasting stibnite gives $\text{Sb}_2\text{O}_3$ , which is then reduced by heating with carbon.	White, brittle, crystalline metal. Its alloys expand on solidification, and therefore give very sharp castings, e.g., for type. It does not tarnish, but may be burned in air, and unites directly with the halogens.	The metal is a constituent of the alloys type metal, Britannia metal and Babbitt metal (used for bearings). Its oxide ( $\text{Sb}_2\text{O}_3$ ) is both basic and acidic. The trichloride, butler of antimony ( $\text{SbCl}_3$ ), is easily hydrolyzed. Tartar emetic ( $\text{SbO}(\text{C}_2\text{H}_3\text{O}_2)_2$ ) is used in medicine and in dyeing.
<b>Argon.</b> Symbol A. At. wt. 39.96. Valence nil. Density 19.3 (oxygen = 32). B. P. $-186^\circ$ . M. P. $-190^\circ$ .	Present in the air 0.94% by volume. To isolate, air is freed from $\text{CO}_2$ by soda-lime, water by $\text{PyOH}$ , oxygen by red-hot copper, nitrogen by magnesium and calcium. From the residual mixture argon is obtained by fractional distillation.	Is a monatomic gas and is identified by its characteristic spectrum seen by examining the light emitted when the gas is placed in a vacuum tube at low pressure and sparked. More soluble in water than nitrogen, 100 vol. water dissolving 4 vol. argon under ordinary conditions.	Forms no compounds, hence its name—does no work.
<b>Arsenic.</b> Symbol As. At. wt. 74.96. Valence III and V. S. G. 5.7. M. P. 460° (sublimes). M. P. 480° (under pressure).	Occ.—free, as arsenical pyrites ( $\text{FeSAs}$ ), as orpiment ( $\text{As}_2\text{S}_3$ ) and as realgar ( $\text{As}_2\text{S}_4$ ). Prep.—by heating arsenical pyrites, $\text{FeSAs} \rightarrow \text{FeS} + \text{As}$ .	A steel-gray, ductile-metallic and crystalline element classed as a metalloïd because intermediate between metals and metalloïds. Its vapor has a density corresponding to $\text{As}_2$ at 644°, and to $\text{As}_4$ at 1700°. It burns in air and unites with the halogens, sulphur and with many metals.	Used for hardening lead for shot. All arsenic compounds are poisonous. White arsenic ( $\text{As}_2\text{O}_3$ ) is partly basic, forming a chloride and partly acidic, forming arsenates. Scheele's gas ( $\text{C}_2\text{H}_3\text{AsO}_2$ ) is a pigment dangerous in wall-papers. Traces of arsenic are detected by Marsh's test, in which the intensely poisonous arsine ( $\text{AsH}_3$ ) is formed.
<b>Barium.</b> Symbol Ba. At. wt. 137.37. Valence II. S. G. 3.6. M. P. red heat.	Occ.—as barites or heavy spar ( $\text{BaSO}_4$ ), and as witherite ( $\text{BaCO}_3$ ). Prep.—by electrolysis of the fused chloride.	A silver-white, lustrous, malleable metal harder than lead. Like calcium, it acts slowly on water to give barium hydroxide and hydrogen. The vapors of its compounds impart a green color to the Bunsen flame.	The peroxide ( $\text{BaO}_2$ ) is used in the manufacture of oxygen and of hydrogen peroxide. The nitrate and chloride in pyrotechny to give green fire. The sulphate as the body for a permanent white paint and for filling glazed paper. All soluble compounds are poisonous.
<b>Bismuth.</b> Symbol Bi. At. wt. 208.0. Valence III (and V). S. G. 9.8. M. P. 266.5°. B. P. c. 1200°.	Occ.—free and as trioxide ( $\text{Bi}_2\text{O}_3$ ) and trisulphide ( $\text{Bi}_2\text{S}_3$ ). Prep.—the ore is roasted and then heated with charcoal and metallic iron to remove traces of sulphur.	An exceedingly brittle, crystalline shining metal, white with a tinge of pink. Bismuth expands on solidification. It does not tarnish, but can be burnt in air. Dissolves in oxygen acids.	Used for making fusible alloys, e.g., Wood's metal. M. P. $-10^\circ$ , which are used in plugs of fire sprinklers and boiler safety valves, and for taking casts. The oxynitrate is used in medicine and as a cosmetic.
<b>Boron.</b> Symbol B. At. wt. 11.0. Valence III. S.G. (amorph.) 2.4. (cryst.) 2.5. B. P. 3500° (sublimes).	Occ.—as boracic acid ( $\text{H}_2\text{BO}_3$ ), borax ( $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ ), colemanite ( $\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 5\text{H}_2\text{O}$ ). Prep.—amorphous boron by reducing $\text{B}_2\text{O}_3$ with Mg. Impure crystal, boron by reducing $\text{B}_2\text{O}_3$ with excess of Al.	Amorphous boron is a greenish black powder that burns in air at 600°, forming $\text{B}_2\text{O}_3$ and also BN. It is oxidized, by hot conc. sulphuric or nitric acids, to boric acid.	The compounds are analogous to those of silicon. Borax is used as a flux, and, in solution, as a mild alkali on account of its hydrolysis. Boric acid is used as a weak antiseptic and preservative.

## CHEMICAL ELEMENTS—Continued

NAME, WITH CERTAIN DATA	OCCURRENCE AND PREPARATION	PROPERTIES	CHIEF COMPOUNDS AND USES
<b>Bromine.</b> Symbol Br. At. wt. 79.92. Valence I. S. G. 3.2. M. P. 80°. M. P. -7.3°.	Oce.—in seawater as alkali bromide, and in the upper layers of salt deposits as sodium and magnesium bromide. Prep.—by treatment of the brines with sulphuric acid and manganese dioxide, or else with chlorine.	A dark red liquid, smelling like chlorine, whose vapor irritates eyes, throat and nose. Dissolves thirty parts of water (bromine water). Combines directly with most other elements, but less vigorously than chlorine.	Potassium bromide is used in medicine, silver bromide in photography. Bromine is used in course of the preparation of organic dyes.
<b>Cadmium.</b> Symbol Cd. At. wt. 112.40. Valence II. S. G. 8.6. M. P. 321.7. B. P. 770°.	Oce.—in association with the zinc ore, as carbonate and sulphide. Prep.—in the distillation of impure zinc, the cadmium comes over in the first portions.	A silver-white metal, more ductile and malleable than zinc. It burns in air, and is attacked by dilute acids.	All the compounds are poisonous, and little ionized. The sulphide (CdS) is the base of "cadmium yellow." The iodide is used in medicine.
<b>Caesium.</b> Symbol Cs. At. wt. 132.61. Valence I. S. G. 2.4. M. P. 26.3°. B. P. 670°.	Oce.—in certain mica, and in the ashes of certain plants. Prep.—by heating the hydroxide (CaOH) with magnesium.	A white silvery metal resembling potassium. It is one of the most active of metals, and decomposes water violently.	The compounds are characterized by giving, especially, two bright lines in the blue of the spectrum (cesium sky-blue).
<b>Calcium.</b> Symbol Ca. At. wt. 40.09. Valence II. (dual spars), and as complex silicates in great variety (feldspars, pyroxenes, amphiboles, etc.). Prep.—by electrolysis of the fused chloride.	Oce.—as carbonate (Island spar, calcite, aragonite, marble, chalk, limestone), sulphate (gypsum), phosphate (apatite), fluorides (fluor spar), and as complex silicates in great variety (feldspars, pyroxenes, amphiboles, etc.). Prep.—by electrolysis of the fused chloride.	A white crystalline metal, harder than lead, that can be cut, drawn, rolled and turned. It attacks water, and burns in the air at a red heat, forming the oxide (CaO) and the nitride (Ca <sub>3</sub> N <sub>2</sub> ). It unites with hydrogen to CaH <sub>2</sub> , whose action on water is a source of hydrogen for balloons.	Calcium oxide (quicklime) is used for mortar and to remove hair from hides. The hydroxide (Ca(OH) <sub>2</sub> ) mixed with sand forms mortar; its solution is lime-water. Plaster of Paris, a less hydrated sulphate, takes up water on setting to form CaSO <sub>4</sub> ·2H <sub>2</sub> O. The phosphates are fertilizers. Bleaching powder is CaClOCl and calcium carbide is CaC <sub>2</sub> . Common glass contains silicates of calcium and sodium.
<b>Carbon.</b> Symbol C. At. wt. 12.00. Valence IV. S. G. diamond 3.5; graphite 2.3; amorphous 1.9. N.C.—not realized.	Oce.—as diamond and graphite, in the free state; in combination with hydrogen as petroleum, with oxygen as carbon dioxide in the air, with these and other elements as coal, and in plant and animal tissues; and as many carbonates. Prep.—by dry distillation of wood or coal, yielding charcoal and coke respectively.	Diamond is crystalline and the hardest of minerals, the dark-colored "soft" being used for cutting and grinding. Graphite has a black metallic luster, is crystalline and may be scratched by the finger-nail. Charcoal is amorphous, and possesses the power of absorbing gases and also coloring matters. All three forms burn in oxygen to produce carbon dioxide.	The carbon compounds form the subject of "Organic Chemistry." Carbon dioxide results from the burning of coal, coke, wood, oil or illuminating gas, from fermentation and decay, which are slow burnings, and is exhaled in the breath. Carbon monoxide, arising from recently-stoked fires, is an exceedingly poisonous gas.
<b>Cerium.</b> Symbol Ce. At. wt. 140.25. Valence III, IV (and VI). S. G. 6.9; M. P. 623°.	Oce.—as silicate in cerite, along with Nd, Pr and La; also in monazite sand. Prep.—by electrolysis of the fused chloride.	A metal with the color and luster of iron, like tin in hardness, and very ductile and malleable. Burns in air more easily and brightly than magnesium.	Welbach incandescent gas mantles contain one per cent of cerium dioxide CeO <sub>2</sub> .
<b>Chlorine.</b> Symbol Cl. At. wt. 35.46. Valence I (and VII). S. G. (liquid) 1.3. M. P. -102°. B. P. -33.6°. M. P. -146°.	Oce.—in seawater as chlorides of the alkalis and alkaline earths, and as like compounds in salt deposits. Prep.—by electrolysis of alkali chloride, fused or in solution; or by the action of manganese dioxide on hydrochloric acid.	A greenish-yellow gas of characteristic odor, with a violent action on the respiratory tract. Unites directly with all elements save oxygen, nitrogen and the argon family. Displaces bromine and iodine from bromides and iodides, and substitutes hydrogen in organic compounds.	The gas is used in extracting gold and in preparing bleaching and disinfecting agents. In presence of water it bleaches many coloring matters. Forms chlorides (as HCl, HClO, CaCl <sub>2</sub> ), hypochlorites (as solution of Ca(OCl) <sub>2</sub> ), chlorates (as KClO <sub>3</sub> , used for matches and in pyrotechny), and perchlorates (as KClO <sub>4</sub> ).
<b>Chromium.</b> Symbol Cr. At. wt. 52.0. Valence II, III and VI. S. G. 6.9. M. P. 1535°. B. P. 1500°.	Oce.—as chromite [Fe(CrO <sub>2</sub> ) <sub>3</sub> ]. Prep.—by reducing Cr <sub>2</sub> O <sub>3</sub> with aluminium filings.	A steel-gray, lustrous, brittle and very hard metal. At high temperatures it burns in air to green Cr <sub>2</sub> O <sub>3</sub> . It is attacked by dilute sulphuric or hydrochloric acid, but not by nitric acid.	The alloy ferrochromium is used in steel-making. Chrome green, the pigment, is Cr <sub>2</sub> O <sub>3</sub> . Chrome yellow is PbCrO <sub>4</sub> . Dichromates (as K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> ) are used in photo-processes, tanning and dyeing and as oxidizing agents, e.g., in batteries.
<b>Cobalt.</b> Symbol Co. At. wt. 58.97. Valence II and III. S. G. 8.5. M. P. 1500°.	Oce.—as smaltite (CoAs <sub>2</sub> ) and cobaltite CoAsS. Prep.—by igniting the oxide in hydrogen.	A white magnetic malleable metal, less tenacious than iron. By exposure it turns pinkish. It is less active chemically than iron.	Its intensely blue nitrates are used in coloring porcelain and constitute the pigment smalt.
<b>Columbium (Niobium).</b> Symbol Nb. At. wt. 92.5. Valence I, II, IV and V. S. G. 12.7; M. P. 1900°.	Oce.—in the mineral columbite. Prep.—by reduction of NbO <sub>3</sub> by paraffin.	A light-gray malleable and ductile metal, as hard as wrought iron, which is not affected by acids, even by aqua regia.	The hydride (NbH) burns in air. The compounds occur with those of tantalum, which they closely resemble.
<b>Copper.</b> Symbol Cu. At. wt. 63.57. Valence I and II. S. G. 8.9. M. P. 1084.1. B. P. 2100°.	Oce.—free, as cuprite (Cu <sub>2</sub> O), copper glance (CuS), chalcopryite (Cu <sub>3</sub> FeS <sub>4</sub> ), melachroite (CuCO <sub>3</sub> ·Cu(OH) <sub>2</sub> ). Prep.—after removal of iron and sulphur, the oxide is reduced by heating with carbon. It is refined electrolytically.	A red, lustrous, very ductile and malleable metal of tensile strength 14 tons per sq. in., second only to silver in electrical conductivity. In ordinary air it gradually becomes coated with basic carbonate. In absence of air, nitric acid alone among the dilute acids attacks it, but in presence of air even the acids found in foodstuffs can dissolve it.	The metal is used for coins, electroplating, electric leads, roofing, cooking vessels and for making alloys, such as brass, bell and gun metals, German silver and the bronzes. The soluble compounds are poisonous, and are therefore used as poisons in agriculture. Blue vitriol is CuSO <sub>4</sub> ·5H <sub>2</sub> O; the basic acetate is verdigris.
<b>Dysprosium.</b> Symbol Dy. At. wt. 162.5. Valence III.	Oce.—in monazite, gadolinite, etc. Prep.—not yet isolated.	The oxide dysprosia, along with three other rare earths, constitutes erbia.	The salts are green or yellow in color and show characteristic absorption bands.
<b>Erbium.</b> Symbol Er. At. wt. 167.4. Valence III.	Oce.—same as for dysprosium. Prep.—not yet isolated pure.	Crude erbia has been separated into erbia, holmia, thulia, and dysprosia.	The salts are rose-colored, and show characteristic absorption spectra.
<b>Europlum.</b> Symbol Eu. At. wt. 152.0. Valence III.	Oce.—in monazite and other rare minerals. Prep.—not yet isolated.	This element so closely resembles samarium that the analytical separation of the two is difficult.	The salts are pinkish and show a faint absorption spectrum.
<b>Fluorine.</b> Symbol F. At. wt. 19.0. Valence I. S. G. (liquid) 1.14 at -167°. M. P. -223°. B. P. -187°.	Oce.—as cryolite (AlF <sub>3</sub> ·3NaF), fluor spar (CaF <sub>2</sub> ) and very widely elsewhere in small quantities. Prep.—by electrolysis of dry hydrogen fluoride at -25°.	A pale yellowish-green gas that unites with every element excepting oxygen and the argon family. It rapidly displaces oxygen from water or chlorine from hydrogen chloride, but even the acids found in foodstuffs can dissolve it.	Hydrogen fluoride is used for etching glass and in silicate analysis. Silver fluoride is soluble and calcium fluoride insoluble, in contrast with the other halides of these metals.
<b>Gadolinium.</b> Symbol Gd. At. wt. 157.3. Valence III.	Oce.—in gadolinite and samarskite. Prep.—not yet isolated.	This element closely resembles terbium in its compounds.	The salts are colorless and show no absorption bands.

## CHEMICAL ELEMENTS—Continued

NAME WITH CERTAIN DATA	OCCURRENCE AND PREPARATION	PROPERTIES	CHIEF COMPOUNDS AND USES
<b>Gallium.</b> Symbol Ga. At. wt. 69.5. Valence III. S. G. 5.9. M.P. 30.1°.	Occ.—in zinc blende and in bauxite. Prep.—by electrolysis of a suitable solution of its salts.	A bluish-white tough metal that may be cut with a knife. Like aluminum, it is soluble in hydrochloric acid and in caustic alkali, but not in nitric acid.	It forms two chlorides ( $\text{GaCl}_3$ and $\text{GaCl}_2$ ) which yield spark spectra very characteristic of gallium.
<b>Germanium.</b> Symbol Ge. At. wt. 72.3. Valence II and IV. S.G. 5.5. M.P. 900°.	Occ.—in the rare mineral argyrodite. Prep.—by the reduction of the dioxide ( $\text{GeO}_2$ ) by carbon.	A grayish-white, brittle, lustrous metal. Insoluble in hydrochloric acid. It combines directly with the halogens.	The close relation of this element to carbon and silicon is shown in the compound germanium chloroform ( $\text{GeHCl}_3$ ).
<b>Gluclumum</b> (or Beryllium). Symbol Gl. At. wt. 9.1. Valence II. S.G. 1.8. M.P. below 900°.	Occ.—in beryl ( $\text{Al}_2\text{Ge}_2\text{Si}_2\text{O}_{10}$ ). Prep.—by electrolysis of the fused double fluoride $\text{GlF}_2 \cdot 2\text{KF}$ .	A hard white metal that tarnishes when heated in air, and is soluble in dilute acids when powdered.	Its hydroxide $[\text{Gl}(\text{OH})_2]$ is feebly acidic as well as basic, thus resembling the hydroxide of zinc. Emerald is beryl colored green by chromium.
<b>Gold.</b> Symbol Au. At. wt. 197.2. Valence I, and III. S. G. 19.32. M.P. 1062.4°.	Occ.—chiefly free, but also as telluride; many specimens of iron pyrites are auriferous. Prep.—from gold-bearing sands by washing away the lighter material, and dissolving the gold from the residue by mercury, which is subsequently separated from the gold by distillation. Quarts ores are pulverized in stamping mills, and the powder is then carried by water over amalgamated copper plates on which the gold collects.	A soft bright-yellow metal, easily scratched by the knife, an excellent conductor of heat and of electricity. The most ductile and the most malleable of all the metals. Chemically, gold is rather inert, and is not attacked by the oxygen of the air, by hydrogen sulphide, nor, indeed, by any single one of the common acids. It is attacked by fused alkalis, yielding aurates, and by aqua regia, yielding chlorauric acid ( $\text{HAuCl}_4$ ).	Pure gold is called 24-carat gold. American, French and German gold coins are 21.6 carats, while British sovereigns are 22 carats, the balance in all these cases being copper. Jewelry is made in 18, 14, 9, etc., carat gold, the addition of copper increasing the hardness and rigidity. Sodium chloraurate ( $\text{NaAuCl}_4$ ) is used for "toning" in photography, while potassium auricyanide ( $[\text{KAu}(\text{CN})_2]$ ) is used in electro-gilding.
<b>Helium.</b> Symbol He. At. wt. 3.99. Valence 0. S. G. (liquid) 0.15. B. P. -268.7°.	Occ.—in air to the extent of 1 to 2 volumes per million; also occluded in certain minerals. Prep.—neon and helium are boiled off crude argon, and the neon solidified by cooling.	The lightest gas after hydrogen, transparent, odorless and colorless, very inert, forming no compounds with other elements.	It is one of the decomposition products of certain other (radio-active) elements.
<b>Hydrogen.</b> Symbol H. At. wt. 1.008. Valence I. H. (liquid) 0.07. M. P. -259°. B. P. -252.8°.	Occ.—in air to the extent of 1 vol. per 20,000 vols. air; combined in water (11.19% by wt.) natural gas, petroleum and all animal and vegetable bodies. Prep.—by treating zinc with hydrochloric or sulphuric acid; by electrolysis of water.	The lightest gas, transparent, odorless and colorless, soluble in water (2 vols in 100 vols. water under everyday conditions), in platinum, in palladium (502 vols. in 1 of gas). Burns in air and in chlorine, and unites with many of the other elements.	Its two oxides are water ( $\text{H}_2\text{O}$ ) and hydrogen peroxide ( $\text{H}_2\text{O}_2$ ), the latter of which is used in solution as a bleaching agent. Every acid contains hydrogen as an essential constituent. Its compounds with carbon and other elements number over 100,000. Hydrogen gas is used for the oxyhydrogen flame and for filling balloons.
<b>Iodine.</b> Symbol I. At. wt. 126.92. Valence I, V and VII. S. G. 4.95. M. P. 114°. B. P. 184°.	Occ.—in zinc blende ( $\text{ZnS}$ ). Prep.—electrolytically from solutions of its salts.	A white metal, malleable and softer than lead.	Its compounds color the nonluminous gas flame blue and show a characteristic blue line in the spectrum.
<b>Iodine.</b> Symbol I. At. wt. 126.92. Valence I, V and VII. S. G. 4.95. M. P. 114°. B. P. 184°.	Occ.—in the ocean, in certain seaweeds, and in Chili mactopier, always in the combined state. Prep.—from iodides by displacement of their iodine by chlorine.	A dark gray brittle solid with a metallic luster. Its vapor is violet, as are its solutions in chloroform and in carbon bisulphide. It requires over 6,000 parts of water for its solution. Combines directly with many elements, but is much less active than chlorine and bromine.	Its structure is used in medicine as a counter-irritant. Potassium iodide ( $\text{KI}$ ) and iodoform ( $\text{CHI}_3$ ) likewise find application in medicine. The alkyl iodides ( $\text{R} \cdot \text{C}_2\text{H}_5\text{I}$ ) are much used in synthetic organic chemistry.
<b>Iridium.</b> Symbol Ir. At. wt. 193.1. Valence III and IV. S. G. 22.45. M. P. 1800°.	Occ.—along with platinum. Prep.—by a complex series of operations from platinum ores.	A white metal, brittle when cold, and very hard. It is attacked by fused alkalis, but not by aqua regia.	It is used for pointing gold pens. Its alloy with 9 parts of platinum is used for standard meter bars on account of its inalterability.
<b>Iron.</b> Symbol Fe. At. wt. 55.85. Valence II and III. S. G. 7.36; pig. 7.03 to 7.73. M. P. 1804°. wrought 1600°. cast 1378°. gray pig 1275°. white pig 1075°.	Occ.—as magnetic oxide ( $\text{Fe}_3\text{O}_4$ ), hematite ( $\text{Fe}_2\text{O}_3$ ), limonite ( $2\text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ ), siderite ( $\text{FeCO}_3$ ), which are important ores; iron pyrites ( $\text{FeS}_2$ ); in rocks as complex silicates, and in plants and animals. Prep.—pig iron is prepared in the blast furnace by reduction of the ore by means of carbon monoxide in presence of a suitable flux. From pig iron, wrought iron is obtained by puddling, and steel by the Bessemer, Siemens-Martin or other process.	A white, malleable, ductile, magnetic metal, uncombined in dry air or air-free water, but rusting in moist air. Easily attacked by dilute acids, but not by fused alkalis. Cast iron contains 2 to 5% of carbon and other impurities, and is hard and brittle. Wrought iron contains less than 0.2% of carbon, and is softer and tougher, with a tensile strength of 22 to 25 tons per sq. in. Steel contains from 0.2 to 1.5% of carbon, is permanently magnetic, may be tempered, and possesses tensile strength up to 100 tons per sq. in.	The metal is used as a structural material, for rails, machinery, tools, etc. Jeweler's rouge and Venetian red consist of the oxide ( $\text{Fe}_2\text{O}_3$ ). Rust is chiefly the hydrated oxide ( $\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$ ). Hammer scale and lodestone have the composition $\text{Fe}_3\text{O}_4$ . Ferric chloride ( $\text{FeCl}_3$ ), ferrous iodide ( $\text{FeI}_2$ ) and other iron compounds are used in medicine. Green vitriol ( $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ ) is used in making ink, and in dyeing. Potassium ferrioxalate ( $[\text{K}_2\text{Fe}(\text{C}_2\text{O}_4)_3]$ ) is used for making Prussian blue, potassium cyanide, etc.
<b>Krypton.</b> Symbol Kr. At. wt. 83.5. Valence 0. M. P. -169°. B. P. -152°.	Occ.—in minute quantity in the air. Prep.—from crude argon by fractional distillation.	An inert, colorless, odorless gas, resembling, but denser than, argon.	It forms no compounds, and is identified by its characteristic spectrum.
<b>Lanthanum.</b> Symbol La. At. wt. 139.0. Valence III and V. S. G. 6.15.	Occ.—as lanthanite $[\text{La}_2(\text{CO}_3)_3 \cdot 8\text{H}_2\text{O}]$ . Prep.—by electrolysis of fused $\text{LaCl}_3$ .	An iron-gray metal tarnishing in air to steel-blue; malleable and ductile. Attacked slowly even by cold water.	When heated in air it forms oxide ( $\text{La}_2\text{O}_3$ ) and nitride ( $\text{LaN}$ ).
<b>Lead.</b> Symbol Pb. At. wt. 207.19. Valence II, and IV. S. G. 11.4. M. P. 326°.	Occ.—as galena ( $\text{PbS}$ ), and in silver ores. Prep.—by calcination of partially roasted galena. Purification is effected by Parkes process.	A soft gray metal, malleable, but of low tensile strength. In presence of air, water acts on lead to produce the hydroxide, which, being slightly soluble, may cause lead poisoning if present in water supplies. When heated in air it is oxidized to litharge ( $\text{PbO}$ ), and, under suitable conditions, to minium ( $\text{Pb}_3\text{O}_4$ ).	The metal is used for water pipes, roofs and gutters and storage batteries. For shot it is alloyed with 0.4% of arsenic. Typometal contains 20% of antimony, 10% of tin, and 70% of lead. Solder and pewter are alloys of lead and tin. The basic carbonates $[\text{Pb}(\text{OH})_2 \cdot 2\text{PbCO}_3]$ , "white lead," is the basis of most oil paints.

## CHEMICAL ELEMENTS—Continued

NAME, WITH CERTAIN DATA	OCCURRENCE AND PREPARATION	PROPERTIES	CHIEF COMPOUNDS AND USES
<b>Lithium.</b> Symbol Li. At. wt. 6.94. Valence I. S. G. 0.53. M. P. 186°. B. P. above 1400°.	Occ.—as a raised fluoride with aluminum in amblygonite. Prep.—by electrolysis of the fused chloride.	A silver-white metal, softer than lead, that tarnishes quickly in air, and is easily acted upon by water. When heated, it unites vigorously with nitrogen.	The carbonate $Li_2CO_3$ is used in medicine as a solvent for uric acid, lithium urate being soluble. The lithium salts give a carmine flame coloration.
<b>Lutetium.</b> Symbol Lu. At. wt. 174.0.	Occ.—in euxenite. Prep.—it has not been isolated.		Its compounds resemble those of ytterbium.
<b>Magnesium.</b> Symbol Mg. At. wt. 24.32. Valence II. S. G. 1.75. M. P. 632°. B. P. 1100°.	Occ.—as magnesite ( $MgCO_3$ ), dolomite ( $MgCO_3 \cdot CaCO_3$ ), carnallite ( $MgCl_2 \cdot 6H_2O$ ) and in very many complex silicates. Prep.—by electrolysis of dried, fused carnallite.	A silver-white metal, ductile when hot. It tarnishes in air, and acts slowly upon water, rapidly on steam. Burns in air to the oxide $MgO$ , emitting a very bright light, used in photography. It unites directly with nitrogen.	The sulphate ( $MgSO_4 \cdot 7H_2O$ ) is known as Epsom salts and is used in medicine, as are the oxide (magnesia), the carbonates and citrate. Magnesium is a light, hard alloy with aluminium.
<b>Manganese.</b> Symbol Mn. At. wt. 54.93. Valence II, III, IV, VI, VII. S. G. 8.0. M. P. ca. 1300°.	Occ.—as pyrolusite ( $MnO_2$ ), besanite ( $Mn_2O_3$ ), hausmannite ( $Mn_3O_4$ ) and manganese spar ( $MnCO_3$ ). Prep.—by heating $MnO_2$ with aluminium filings.	A steel-gray, hard, brittle metal with a pinkish tinge. It rusts in moist air and is attacked by dilute acids.	Ferromanganese and spiegeleisen are alloys with iron, used in steel making. With copper it forms the hard, tough manganese bronze, with tensile strength up to 30 tons per sq. in. Impure sodium permanganate ( $NaMnO_4$ ) is used in disinfecting as Condy's fluid.
<b>Mercury.</b> Symbol Hg. At. wt. 200.0. Valence I and II. S. G. 13.6. M. P. -39.5°. B. P. 356.93°.	Occ.—free and as cinnabar ( $HgS$ ). Prep.—by roasting cinnabar $HgS + O_2 \rightarrow Hg + SO_2$ .	A silver-white, mobile liquid with a vapor pressure at 0° of 0.0002 mm. It tarnishes but slowly in air and is attacked only by dilute nitric among the dilute acids. The vapor is monatomic.	It is used for filling thermometers and barometers. Its alloys are called amalgams, some of which are used in dentistry. Calomel ( $Hg_2Cl_2$ ) is administered internally in medicine; corrosive sublimate ( $HgCl_2$ ) forms a solution with very powerful germicidal properties. The ferromolybdenum alloys are used in the manufacture of special steels.
<b>Molybdenum.</b> Symbol Mo. At. wt. 95.9. Valence III, IV, V, S. G. 9.0. M. P. 2110° (VI).	Occ.—as molybdenite ( $MoS_2$ ) and wulfenite ( $PbMoO_4$ ). Prep.—by reducing the oxides with aluminium powder.	A white metal, as malleable as iron, that will not scratch glass. Insoluble in hydrochloric or dilute sulphuric acid.	
<b>Neodymium.</b> Symbol Nd. At. wt. 144.3. Valence III and IV. S. G. 6.9. M. P. 640°.	Occ.—with cerium and lanthanum. Prep.—by electrolysis of the fused chloride.	A yellowish metal, tarnishing in air.	The salts are rose-violet in color, and their solutions show characteristic absorption spectra.
<b>Neon.</b> Symbol Ne. At. wt. 20.2. Valence 0. R. P. ca. -243°.	Occ.—in minute quantity in the atmosphere. Prep.—neon and helium are boiled out of crude argon, and the neon separated from helium by cooling with liquid hydrogen.	A colorless, transparent, odorless, inert gas, resembling argon.	It forms no compounds, and is recognized by its characteristic spectrum.
<b>Nickel.</b> Symbol Ni. At. wt. 58.68. Valence II and III. S. G. 8.9. M. P. ca. 1455°.	Occ.—as niccolite ( $NiAs$ ) and nickel glance ( $NiAs_2$ ). Prep.—by igniting the oxalate in hydrogen.	A white, very hard, lustrous metal, malleable, ductile and tenacious. It rusts but slowly in air, and is attacked easily by only nitric acid.	The metal furnishes a protective coating when plated on iron. German silver is an alloy of nickel, copper and zinc. Nickel steel is used for armor plates. Manganin, containing nickel, copper and manganese, is used for electrical resistances.
<b>Nitrogen.</b> Symbol N. At. wt. 14.01. Valence III and V. M. P. -214°. B. P. -194°.	Occ.—free nitrogen forms about four-fifths of air by volume. As Bengal saltpeter ( $KNO_3$ ), Chili saltpeter ( $NaNO_3$ ), and as an essential constituent of vegetable and animal protoplasm. Prep.—by heating ammonium nitrite, by oxidation of ammonia, etc.	A colorless, odorless, transparent gas, rather inactive chemically. At ordinary temperature and pressure, 100 volumes of water dissolve 1.5 volumes of nitrogen. It unites directly with strongly heated boron, lithium, calcium and magnesium.	Nitrous oxide ( $N_2O$ ), or laughing gas, is used, by dentists. Nitric acid ( $HNO_3$ ) has many applications in technical chemistry. Ammonia ( $NH_3$ ) is a very soluble gas. Ammonium sulphate $[(NH_4)_2SO_4]$ and Chili saltpeter are used as nitrogenous manures. Nitrogen is a constituent of the anilindyes, the proteins and many other important classes of organic substances.
<b>Osmium.</b> Symbol Os. At. wt. 190.9. Valence II, III, IV, VI, VII. S. G. 22.477. M. P. ca. 2400°.	Occ.—along with platinum. Prep.—by reducing $OsO_4$ .	A gray metal, harder than glass, the heaviest of known bodies.	Its alloy with iridium is used in tipping gold pens. Osmium tetroxide ( $OsO_4$ ) is used as a microscopic stain for fat.
<b>Oxygen.</b> Symbol O. At. wt. 16.00. Valence II. S. G. (liquid at h.p.) 1.13. M. P. -227°. B. P. -182.9°.	Occ.—free oxygen forms about one-fifth of air by volume. Water contains 88.8% of oxygen. The rocks of the earth's crust contain about 45% in combination, chiefly as silicates. Prep.—in the laboratory, by heating potassium chlorate ( $KClO_3$ ). Commercially, from the air.	A colorless, odorless, tasteless, transparent gas, slightly heavier than air. At ordinary temperature and pressure, 100 volumes of water dissolve 3 volumes of oxygen. It is very active chemically, combining directly with all but a few of the other elements, and with all oxides. Sulphur, phosphorus, etc., burn much more vigorously in oxygen than in air. Liquid oxygen is magnetic.	The gas is acid compressed in mild steel cylinders, and is used for the oxyhydrogen blowpipe and in medicine, besides for chemical purposes. It is necessary to support animal respiration and to sustain ordinary combustion. It enters as a constituent into all acids, most salts and many organic compounds.
<b>Palladium.</b> Symbol Pd. At. wt. 106.7. Valence II and IV. S. G. 11.9. M. P. ca. 1555°.	Occ.—along with platinum, and with gold in Brazil. Prep.—by a complex series of processes from platinum ores.	A silvery, malleable and ductile metal, related to platinum, unlike which, however, it is attacked by nitric acid. Under suitable conditions it can take up over 900 volumes of hydrogen.	Since it does not tarnish, it is used for coating silver goods and by dentists as a substitute for gold.
<b>Phosphorus.</b> Symbol P. At. wt. 31.04. Valence III and V. S. G. (white, 1.82, red, 2.25, black, 2.68). M. P. white, 44°, red, 260°.	Occ.—as phosphates, such as apatite $[Ca_5(PO_4)_3]$ , in bones, teeth, brain and seeds of plants. Prep.—by reduction of calcium phosphate by carbon in the electric furnace in presence of a suitable flux.	Phosphorus exists in two allotropic modifications: white phosphorus is waxy in consistency, soluble in carbon bisulphide, evil smelling and poisonous; red phosphorus is a solid, insoluble in carbon bisulphide, odorless and not poisonous. White phosphorus has a low ignition temperature, hence its former use in matches.	Red phosphorus is used in the manufacture of matches, as also is the compound $P_4O_6$ . In the form of superphosphate of lime $[CaH_2(P_2O_7)_2]$ phosphorus is an important agricultural manure. The chlorides ( $PCl_3$ and $PCl_5$ ) are much used in organic chemistry.
<b>Platinum.</b> Symbol Pt. At. wt. 195.2. Valence II and IV. S. G. 21.45. M. P. 1772°.	Occ.—free, alloyed with the platinum metals, as nuggets in alluvial sands in the Urala, California, etc. Prep.—it is freed from the metals with which it is alloyed by a complex series of processes.	A silvery, tenacious, ductile and malleable metal, unaltered in moist air and unattacked by any single common acid. Aqua regia, fused alkalis, alkali nitrates and cyanide attack it, however. Platinum "sponge" and "black" are finely divided forms.	On account of its resistance to acids, platinum is much used for chemical vessels. Since platinum has a coefficient of expansion very close to that of glass, platinum wires and crucibles fused through glass without danger of breakage on cooling. The salts are used in photography.



## CHEMICAL ELEMENTS—Continued

NAME, WITH CERTAIN DATA	OCCURRENCE AND PREPARATION	PROPERTIES	CHIEF COMPOUNDS AND USES
<b>Potassium.</b> Symbol K. At. wt. 39.10. Valence I. S. G. 0.86. M. P. 63.5°. B. P. 687°.	Occ.—as sylvite (KCl), carnallite (KCl, MgCl <sub>2</sub> ·6H <sub>2</sub> O); in plant and animal ashes, and in many complex silicates. Prep.—by reduction or by electrolysis of fused potassium hydroxide (KOH).	A silver-white lustrous metal, as soft as wax, tarnishing instantly in moist air. Chemically it is a very active metal, decomposing water in the cold and uniting violently with the halogens, sulphur and oxygen.	An alloy with sodium is used in filling high-temperature thermometers. Bengal salt-petre in the nitrate and is used in pyrotechny, for gunpowder and as a preservative. The iodide (KI) is used in medicine. The chloride, like the nitrate, is used as a source of oxygen in pyrotechny and for match heads. Caustic potash (KOH) has many chemical applications. The cyanide (KCN) is used in gold extraction. The salts are leaf-green in color, and their solutions have characteristic absorption spectra.
<b>Francium.</b> Symbol Fr. At. wt. 140.6. Valence III and IV. S. G. 6.47. M. P. 940°.	Occ.—with cerium and lanthanum. Prep.—by electrolysis of the fused chloride.	A yellowish metal, remaining untarnished in air.	The rays from radium compounds (such as RaBr <sub>2</sub> , RaCl <sub>2</sub> , RaCO <sub>3</sub> ) act destructively on living tissues and on bacteria. One gram of radium in any of its compounds gives off about 100 calories of heat per hour.
<b>Radium.</b> Symbol Ra. At. wt. 226.4. Valence II. S. G. 12.1. M. P. 940°.	Occ.—in minute quantity in pitchblende and other uranium minerals. Prep.—the metal has recently been isolated; the bromide separated from the barium bromide prepared from pitchblende by fractional crystallization.	In all of its compounds, the metal has the power of emitting certain radiations. These can pass through matter that is opaque to light, render air a conductor, affect a photographic plate and cause a silver-sulphide screen to fluoresce visibly.	The red chloride (RaCl <sub>2</sub> ) is formed by the action of chlorine upon the metal.
<b>Rhodium.</b> Symbol Rh. At. wt. 102.9. Valence II, III, and IV. S. G. 12.1. M. P. above 2000°.	Occ.—in the ore of platinum. Prep.—by a complex series of processes from platinum ore.	A silver, malleable and ductile metal, not tarnishing in air and not attacked by aqua regia.	The compounds show characteristic flame-spectra, and were recognized as those of a new element spectroscopically by Bunsen.
<b>Rubidium.</b> Symbol Rb. At. wt. 85.45. Valence I, III, and IV. S. G. 1.52. M. P. 38.5°. B. P. 696°.	Occ.—the salts are associated with salts of potassium. Prep.—similar to that of potassium.	A silver-white metal resembling potassium, like which it attacks water vigorously.	The following oxides are known: RuO <sub>2</sub> , RuO <sub>3</sub> , Ru <sub>2</sub> O <sub>3</sub> , as well as salts corresponding to RuO <sub>2</sub> and RuO <sub>3</sub> .
<b>Ruthenium.</b> Symbol Ru. At. wt. 101.7. Valence III, IV, V, VI, VII, and VIII. S. G. 12.1. M. P. above 2000°.	Occ.—in the ore of platinum. Prep.—by a complex series of processes from platinum ore.	A hard, white, brittle metal, oxidized when heated in air, scarcely attacked by aqua regia.	The salts are topaz-yellow in color, and are similar to those of ruthenium.
<b>Samarium.</b> Symbol Sm. At. wt. 150.4. Valence II and III. S. G. ex. 7.7. M. P. 1200 to 1400°.	Occ.—in the mineral samarskite. Prep.—by electrolysis of the chloride.	A whitish-gray metal, tarnishing in air.	The chloride (SmCl <sub>3</sub> ) shows a characteristic spark spectrum.
<b>Scandium.</b> Symbol Sc. At. wt. 44.1. Valence III.	Occ.—free in some specimens of sulphur, and in combination with lead, iron and other metals, as in pyrites. Prep.—(amorphous) by reducing selenium acid (H <sub>2</sub> SeO <sub>4</sub> ) by sulphur dioxide.	The existence of this element, whose oxide was discovered in 1879, was predicted by Mendeleev in 1869.	Selenium cells are used as indicators of intensity of illumination. The compounds strongly resemble those of sulphur. Hydrogen selenide is an evil-smelling, inflammable gas. Selenic acid (H <sub>2</sub> SeO <sub>4</sub> ) is a more powerful oxidant than sulphuric acid, and dissolves gold.
<b>Selenium.</b> Symbol Se. At. wt. 79.2. Valence II, IV, and VI. S. G. amorphous 4.27, monoclinic 4.47, hexagonal 4.8. M. P. amorphous 50°, monoclinic 170 to 180°, hexagonal 217°. B. P. 690°.	Occ.—in the minerals enargite and gadolinite. Prep.—the metal has not been isolated.	Three varieties are known: (1) red amorphous, soluble in carbon bisulphide, from which it is deposited as (2) red translucent monoclinic crystals, soluble in carbon bisulphide, (3) blue-gray metallic selenium, insoluble in carbon bisulphide. This last form conducts electricity many times better when exposed to light, and the better the brighter the light.	The chloride (SeCl <sub>4</sub> ) shows a characteristic spark spectrum.
<b>Silicon.</b> Symbol Si. At. wt. 28.3. Valence IV. S. G. amorphous 2.0, crystalline 24.9. M. P. 1200°. B. P. ca. 3500°.	Occ.—as silicon dioxide (SiO <sub>2</sub> ) occurs as flint, quartz, quartz sand, etc. The igneous rocks are composed largely of silicates, and the element constitutes over 25% of the earth's crust. Prep.—by reducing sand with coke in the electric furnace.	Amorphous silicon is a brown powder that burns when heated in air. Crystalline silicon forms black needles. It is less active than the amorphous variety and is attacked only slowly by a mixture of hydrofluoric and nitric acids. It unites with fluorine, however, at ordinary temperatures.	The "pigs" of silicon made at Niagara are used in steel-making. The ornamental variety of quartz find uses as gemstones. The element is used in the manufacture of several chemicals. Sodium chloride (NaCl) is a necessity of life to most animals; and is used in the manufacture of hydrochloric acid, chlorine and sodium compounds. Sodium carbonate (Na <sub>2</sub> CO <sub>3</sub> , 10H <sub>2</sub> O) or washing soda, and sodium hydroxide (NaOH) are used for cleaning, and in the manufacture of soap and chemicals. Baking soda is sodium bicarbonate (NaHCO <sub>3</sub> ). The sulphate (Na <sub>2</sub> SO <sub>4</sub> , 10H <sub>2</sub> O) is known as Glauber's salt; the bisulphate, by photophosphors, as "type." The nitrate and chloride are used in pyrotechny for red fire. All volatile compounds color the Bunsen flame red.
<b>Silver.</b> Symbol Ag. At. wt. 107.88. Valence I. S. G. 10.53. M. P. 960°. B. P. 2050°.	Occ.—native, as sulphide (Ag <sub>2</sub> S) often associated with galena; chlorides (AgCl), etc. Prep.—from lead by the Pattinson or the Parkes process; from the ore by the Mexican and other processes.	A white, highly lustrous, tough, very ductile and malleable metal, the best conductor of heat and electricity known. Liquid silver dissolves oxygen. It is unaffected by the oxygen of moist air, and its tarnishing is due to the action of hydrogen sulphide. It dissolves in dilute nitric and is concentrated hot sulphuric acid. A silver-white metal, as soft as wax, that may be welded at ordinary temperatures. Like potassium it is very active, uniting directly with many other elements, and attacking water vigorously in the cold.	It is employed for articles of use and of ornament and for coinage. U. S. sterling silver contains 90% silver, with 10% copper. Lunar caustic is silver nitrate. This salt and the halides of silver are extensively used in photography. For electroplating, a bath of potassium argenticyanide [KAg(CN) <sub>2</sub> ] is used.
<b>Sodium.</b> Symbol Na. At. wt. 23.00. Valence I. S. G. 0.97. M. P. 98°. B. P. 742°.	Occ.—in the sea as chloride (NaCl) in salt deposits as chloride, borate, nitrate; in many complex silicates in rocks. Prep.—by electrolysis of fused sodium hydroxide (NaOH).	A white metal, softer than calcium and harder than sodium, tarnishing to a yellow tinge. Like calcium, it is active enough to attack water vigorously in the cold.	The metal is used in the manufacture of several chemicals. Sodium chloride (NaCl) is a necessity of life to most animals; and is used in the manufacture of hydrochloric acid, chlorine and sodium compounds. Sodium carbonate (Na <sub>2</sub> CO <sub>3</sub> , 10H <sub>2</sub> O) or washing soda, and sodium hydroxide (NaOH) are used for cleaning, and in the manufacture of soap and chemicals. Baking soda is sodium bicarbonate (NaHCO <sub>3</sub> ). The sulphate (Na <sub>2</sub> SO <sub>4</sub> , 10H <sub>2</sub> O) is known as Glauber's salt; the bisulphate, by photophosphors, as "type." The nitrate and chloride are used in pyrotechny for red fire. All volatile compounds color the Bunsen flame red.
<b>Strontium.</b> Symbol Sr. At. wt. 87.63. Valence II. S. G. 2.55. M. P. ca. 800°.	Occ.—as strontianite (SrCO <sub>3</sub> ) and celestine (SrSO <sub>4</sub> ). Prep.—by electrolysis of the fused chloride.	A white metal, softer than calcium and harder than sodium, tarnishing to a yellow tinge. Like calcium, it is active enough to attack water vigorously in the cold.	The nitrate and chloride are used in pyrotechny for red fire. All volatile compounds color the Bunsen flame red.

## CHEMICAL ELEMENTS—Continued

NAME, WITH CERTAIN DATA	OCCURRENCE AND PREPARATION	PROPERTIES	CHIEF COMPOUNDS AND USES
<b>Sulphur.</b> Symbol S. At. wt. 32.07. Valence II, IV and VI. S. G. 2.06. Monoclinic 1.96. M. P. rhombic 112.4°, monoclinic 119°. B. P. 444.9°.	Occ.—native, in combination with most metals as sulphides, and with some metals as sulphates. Prep.—by melting the free sulphur away from the rocky matrix, and subsequent purification by distillation.	Natural sulphur is rhombic in crystalline form, yellow, brittle, of vitreous luster, and a poor conductor of heat and electricity. This and the monoclinic variety are soluble in carbon bisulphide, while amorphous sulphur is not. When heated, sulphur unites directly with most of the other elements.	Sulphur is used to prepare sulphur dioxide ( $\text{SO}_2$ ), which is used in making sulphuric acid and in bleaching; also, in the manufacture of vulcanizing rubber and in the manufacture of black gunpowder, fireworks and matches. Sulphuric acid ( $\text{H}_2\text{SO}_4$ ) is the chemical industry which iron is to engineering.
<b>Tantalum.</b> Symbol Ta. At. wt. 181.0. Valence II, IV and V. S. G. 16.6. M. P. bet. 2250° and 2300°.	Occ.—in tantalite and many other rare minerals. Prep.—by the action of sodium on sodium tantalochloride ( $\text{NaTaCl}_6$ ).	A hard silver-white metal, ductile and malleable when hot, of very high tensile strength. The hot metal can absorb 740 volumes of hydrogen. It is not attacked by aqua regia.	The metal is used for filaments for electric lamps, which possess twice the efficiency of the carbon filament lamp.
<b>Tellurium.</b> Symbol Te. At. wt. 127.5. Valence II, IV and VI. S. G. 6.25. M. P. 449°. B. P. 1400°.	Occ.—free and as tellurides. Prep.—by reducing telluric oxide ( $\text{H}_2\text{TeO}_6$ ) by means of sulphur dioxide.	The crystalline variety is white, has metallic luster, and conducts heat and electricity. The precipitated variety is black and of lower density. The element is related to sulphur but is more metallic in character.	The compounds find few applications. Telluric acid ( $\text{H}_2\text{TeO}_6$ ) has basic as well as acid characters, in keeping with the position of the element between metals and nonmetals.
<b>Terbium.</b> Symbol Tb. At. wt. 158.9. Valence III.	Occ.—in gadolinite, samarskite, and other rare minerals. Prep.—the metal has not been prepared.		The salts show no absorption spectrum.
<b>Thallium.</b> Symbol Tl. At. wt. 204.0. Valence I and II. S. G. 11.5. M. P. 303°.	Occ.—in crocoisite, and in small quantities in many samples of iron pyrites. Prep.—it is precipitated by zinc from a solution obtained by suitable treatment of the dust from sulphuric acid works.	A bluish-white lead-like metal, rather soft, malleable, but of low tensile strength. It decomposes water rapidly at red heat, and dissolves in dilute acids.	It forms two sets of salts, the thallous (e.g., $\text{TlCl}$ ) and the thallic (e.g., $\text{TlCl}_3$ ). All the compounds show a characteristic green line in the spectrum.
<b>Thorium.</b> Symbol Th. At. wt. 232.0. Valence IV. S. G. 11.0.	Occ.—in monazite sand. Prep.—by reducing potassium thorium chloride with sodium, or by electrolysis of the chloride in a mixture of fused potassium and sodium chlorides.	A metal with the color of nickel, that can be burnt in air. Hydrochloric acid attacks it but slowly.	The nitrate ( $\text{Th}(\text{NO}_3)_4 \cdot 6\text{H}_2\text{O}$ ) is used in making Welsbach incandescent mantles, which consist of 99% of $\text{ThO}_2$ . All the compounds are radio-active.
<b>Thulium.</b> Symbol Tm. At. wt. 168.5. Valence III. M. P. 1700°.	Occ.—in gadolinite and other yttrium minerals.		The salts are of a pale bluish color which is destroyed very easily by minute quantities of cerium.
<b>Tin.</b> Symbol Sn. At. wt. 118.0. Valence II and IV. S. G. 7.3. M. P. 232°. B. P. ca. 1600°.	Occ.—as cassiterite ( $\text{SnO}_2$ ). Prep.—after roasting, the ore is reduced by heating with carbon.	A silver-white, rather soft, very malleable and ductile metal, practically unchanged in air. When heated, it may be burned in air. Dilute nitric acid is the only dilute acid that attacks it rapidly. When kept long at temperatures below zero C., ordinary tin changes to a brittle gray powdery modification. This form is the stable one below 20°.	Large quantities of tin are used in the tinning of iron for tinplate. It is a constituent of the alloys Bismutella metal, pewter, solder, bronze, and type metal. Two sets of salts, stannous (e.g., $\text{SnCl}_2$ ) and stannic (e.g., $\text{SnCl}_4$ ). "Pink salt" ( $\text{Na}_2\text{SnCl}_6$ ) is used in dyeing. "Mosaic gold" is $\text{SnAu}$ .
<b>Titanium.</b> Symbol Ti. At. wt. 48.1. Valence II, III and IV. S. G. 4.5. M. P. below 1850°.	Occ.—as rutile ( $\text{TiO}_2$ ) and in titanite iron ore ( $\text{FeTiO}_3$ ). Prep.—by reducing the chloride ( $\text{TiCl}_4$ ) by means of sodium.	A hard, brittle metal, resembling polished steel in appearance, that may be forged at a low red heat. It dissolves in dilute sulphuric acid, and decomposes steam at 800°. It unites easily with nitrogen.	The element is very widely disseminated, though in small quantity. It is contained in the ashes of all plants.
<b>Tungsten.</b> Symbol W. At. wt. 184.0. Valence II, IV, V and VI. S. G. 19.3. M. P. ca. 2800°.	Occ.—as wolfram ( $\text{FeWO}_4$ ) and as scheelite ( $\text{CaWO}_4$ ). Prep.—by reducing tungstic acid ( $\text{H}_2\text{WO}_4$ ) by carbon at a high temperature.	A hard, brittle, gray metal, attacked by chlorine only at 250°, although it can be caused to burn in air. It is slowly acted upon by dilute acids and even by water.	The metal is used for the filaments of incandescent electric lamps, giving an efficiency of 1.3 watts per candle power. Tungsten steel has 8% W. Sodium tungstates are used as mordants in dyeing.
<b>Uranium.</b> Symbol U. At. wt. 238.5. Valence III, IV, V and VI. S. G. 18.7. M. P. ca. 1500°.	Occ.—as pitchblende, which contains $\text{U}_3\text{O}_8$ . Prep.—by reducing the oxides with aluminium.	A white lustrous metal, tarnishing in air and attacking water slowly in the cold. It combines directly with many of the other elements.	All the compounds of uranium are radio-active in proportion to their uranium content. Glass to which uranium compounds have been added shows a greenish-yellow fluorescence.
<b>Vanadium.</b> Symbol V. At. wt. 51.06. Valence II, III, IV and V. S. G. 6.5.	Occ.—in a few rather rare minerals. Prep.—by reduction of the dichloride ( $\text{VCl}_2$ ) in hydrogen.	A silver-white lustrous metal harder than quartz. It does not tarnish nor attack water at ordinary temperatures, but can be burnt in oxygen.	Vanadium added to steel in even small quantity (0.2%) increases the tenacity and elastic limit without reducing the ductility.
<b>Xenon.</b> Symbol Xe. At. wt. 131.2. Valence 0. B. P. 109°.	Occ.—in minute quantity in the air, less than one volume in 100 millions. Prep.—by fractionation of liquid argon.	A transparent, colorless and odorless gas, very inert like its congener argon. It is the densest of the argon family.	It forms no compounds.
<b>Ytterbium (Neodyterbium).</b> Symbol Yb. At. wt. 173.0. Valence III.	Occ.—in gadolinite, euxenite and other rare minerals. Prep.—the metal has not been isolated.		The compounds show a characteristic spark spectrum.
<b>Yttrium.</b> Symbol Y. At. wt. 88.9. Valence III.	Occ.—in gadolinite, euxenite and other rare minerals. Prep.—by electrolysis of sodium yttrium chloride.	A gray lustrous metal.	The chloride yields a characteristic, though complex, spectrum.
<b>Zinc.</b> Symbol Zn. At. wt. 65.37. Valence II. S. G. 6.9 to 7.2. M. P. 419.5°. B. P. 927°.	Occ.—as zinc blende ( $\text{ZnS}$ ), calamine ( $\text{ZnCO}_3$ ), zincite ( $\text{ZnO}$ ), etc. Prep.—after roasting, the ore is reduced by coal, the metal distilling off.	A bluish-white, lustrous, brittle metal, that is malleable and ductile at 120°. It tarnishes in moist air, attacking water slowly in the cold and rapidly when heated in steam. It dissolves in dilute acids and in sodium hydroxide solution.	Sheet zinc is used for roofs and gutters. Iron is galvanized by dipping it in molten zinc, and so protected from rusting. Zinc is used for galvanic batteries and alloyed with copper, to make brass. The salts are used in medicine; the chloride and sulphate yield antiseptic solutions.
<b>Zirconium.</b> Symbol Zr. At. wt. 90.6. Valence IV. S. G. 4.1.	Occ.—as zircon ( $\text{ZrSiO}_4$ ). Prep.—by reducing the oxide ( $\text{ZrO}_2$ ) with carbon in the electric furnace.	A hard gray metal, remaining bright in air and only slowly oxidized at a white heat. It is dissolved by aqua regia and by caustic potash solution.	The oxide is contained in some incandescent gas mantles.

**THE CHEMISTRY OF FOODS.**—Food is anything which, taken into the alimentary canal, furnishes heat and energy to the system, repairs waste and builds tissue.

The common idea of food is confined to solid or semisolid foods having the above properties. Liquid foods are usually spoken of as drinks or beverages. Condimental substances, such as salt, pepper, spices, etc., are generally segregated from the ordinary classification of foods. There is a legal definition of foods found in the act of Congress of June 30, 1906, which is as follows:

"The term 'food,' as used herein, shall include all articles used for food, drink, confectionery, or condiment by man or other animals, whether simple, mixed, or compound." This comprehensive definition will be followed in this article.

**Kind of Foods.**—According to their predominant characteristics for nutritive purposes, foods are recognized as of the following kinds:

**Nitrogenous.**—Food material containing nitrogen as a distinctive element. The common names, *protein* or *protein* is applied to this class of foods. Most of the true protein foods also contain sulphur as an essential ingredient. Examples of characteristic protein foods are found in lean meat, white of egg, gliadin of wheat, hordein of barley, zein of maize, etc. Among the liquid foods, milk contains casein, which is a most important ingredient, and albumen, a protein food soluble in cold water. Other forms of protein are insoluble in cold water but are soluble in salt solutions, alcohol, etc. By means of these various solvents protein matter can be separated into different classes. Protein food is often described as a tissue builder, but this is not a strictly correct classification. Only certain tissues of the body, such as the muscle, the nerve and the brain, are composed largely of protein. Tissues such as fat and bone are composed largely of other substances.

**Starch and Sugar.**—Carbohydrates form by far the largest bulk of human foods. They are typically represented by starch and sugar. There are many carbohydrates in foods, however, which are more or less useful but not important as regards quantity or digestibility. The so-called woody tissues and fiber in foods are composed of carbohydrates, but these are of more importance for the nourishment of domesticated animals than for man. For practical purposes the term *carbohydrates* applied to human foods embraces only starch and sugar. These substances in a pure state are characterized by being free of both nitrogen and sulphur, which are, as above stated, the most distinctive constituents of protein. They consist solely of carbon, oxygen and hydrogen, the oxygen and hydrogen existing in the proportions to form water.

**Kind of Sugars.**—Sugars are of various kinds, the most important for human nourishment being the substance known as cane sugar, which has the composition of  $C_{12}H_{22}O_{11}$ . Sugar is an abundant product of almost every plant. It is stored especially, however, in some certain plants in such a manner as to become available for extraction. The principal sugar producing plants are the sugar cane, sugar beet, the maple, and the sugar palm. Practically all the sugar of commerce comes from the sugar cane and the sugar beet. The amounts made from other sources are insignificant. In addition to cane sugar there are other varieties of sugar derived

from starch. Among these perhaps the most important for dietetic purposes is maltose. Maltose is a sugar derived from starch in the process of the sprouting of the grains containing starch, or by acting upon starch by sprouted barley (malt). The starch of cereal grains is largely converted into maltose by the ferment of the malt. Starch is also converted into sugar by the ferments of the digestive organism. The saliva begins this conversion and it is completed in the intestinal tract, especially in the small intestine. Starch is also converted into sugar by the action of a dilute acid at a high temperature, and the sugar thus formed is known as dextrose. Glucose, cane sugar, maltose and dextrose are all valuable foods, furnishing particularly heat and energy. Starch, as such, is not available for nutritive purposes, being insoluble and incapable of assimilation. There are many other forms of sugar or sugar-forming substances found in plants, among them levulose, the companion of dextrose, found in levulon particularly in the dahlia, artichoke and certain cacti. When cane sugar is eaten or when it is treated with a dilute acid it is converted into a mixture of equal parts of dextrose and levulose. Honey is sugar exuded by the blossoms of plants and collected and stored by bees, and consists chiefly of cane sugar which has been converted as described above by nature or the bees and hence is a mixture of approximately equal parts of dextrose and levulose.

**Glycerides.**—Fats are also important foods, furnishing weight for weight a larger quantity of heat and energy than any other food product. Fats exist in various forms. When they are solid or semisolid at ordinary temperatures they are called *fats*; when they are liquid at ordinary temperatures they are called *oils*. Among the fats some of the most important for food purposes are butter, lard and tallow; among the oils, olive, cotton-seed, peanut and sesame. The fats are chemically known as glycerides, being a compound produced by the union of a fat acid and glycerine. In the fresh, pure state they contain but little free acid, but on standing for a long time larger quantities of free acid are found. The rancidity of the fat, however, does not depend solely upon its quantity of free acid, but upon other conditions due probably to bacterial or enzymic action. Warmth and light tend to render fats and oils rancid, while keeping them cool and in the dark tends to preserve them from rancidity.

**Minerals.**—The fourth class of foods are those of a mineral character, namely, foods which are essentially composed of mineral substances. Among the most important of the mineral foods in the nutrition of man are phosphorus and lime. These two bodies go to make up the greater part of bone tissue and are found as essential ingredients in many parts of the body. Phosphorus and lime are not usually found in any concentrated form in food products, but are distributed in small quantities in nearly all foods. The phosphorus which nourishes the body is ingested usually in an organic combination and not as phosphoric acid. Certain food products, as, for instance, cereals and eggs, are particularly rich in organic phosphorus. Lime is found in nearly all food products and especially in cereals and wheat.

Mineral substances other than phosphorus and lime are also useful to some extent in nutrition, as, for instance, iron, potash, and soda, the latter being valuable

more for their incidental properties than because of their occurrence in the tissues of the body. In other words, it may be said that the blood in order to perform its functions must have a certain saline content, without which its circulation and the carrying of food to all parts of the body would be impossible. These saline materials, although not entering into the tissues of the body, must be regarded as essential parts of our food.

**Condimentals.**—Condiments are useful more for their effect on palatability than for purposes of pure nutrition. Palatability, however, has important relations to digestion, and hence condiments are properly classed as foods. Most condimental substances have some nutritive properties, containing as they do more or less starch, sugar, protein and fats. Vinegar, of which the most important ingredient is acetic acid, furnishes a certain degree of heat and energy, inasmuch as all the acetic acid is burned in the body, the products being water and carbon dioxide. Salt does not enter into the tissues of the body but affords hydrochloric acid, which is essential to digestion. On the other hand, wood smoke, a valuable condiment, does not have any food value.

**Manner in Which Food Performs Its Functions.**—All food products ingested in the alimentary canal, if not already in a condition suitable for digestion, are prepared by previous mastication. The importance of the mastication of the food is shown by two facts: (1) The food in order to be digested must be properly subdivided; (2) the mixing of saliva with starchy foods is an important adjunct to digestion. In so far as meat foods are concerned, the admixture of saliva is perhaps of no importance in digestion, and the need of complete mastication is not so evident. The chief functions of food have been noted in the original definition. All foods taken into the body, with the possible exception of water and wood smoke, undergo profound modifications. The process of digestion is essentially a chemical one, and consists in the thorough destruction of the ingested forms of matter and the building up of entirely new combinations. Attention may be called, for instance, to the fact that the fat of the human body does not consist of any particles of the fat ingested in the food, but is a substance which is generated by combinations of particles of matter in the processes of digestion and assimilation. The tissues of the body, under a selective influence which is not fully understood, build out from the current of circulating blood those particular particles of matter which go to build them up and reject those which are of no use.

**Metabolism.**—The building of tissue, especially in the growing animal, is one of the chief functions of foods. When an animal has reached maturity it remains in practically the same condition for a number of years. In this condition the building of new tissues ceases and nature is satisfied with restoring those which are destroyed and excreted. This process of repairing waste keeps the adult body in a state of equilibrium for a given time, but as old age comes on the repair does not keep pace with the waste and the natural decadence of age ensues. The process of change, which food undergoes from its entry into the body until excreta are voided is called *metabolism*.

**Foods as Fuel.**—The next most important function of the food is to furnish heat

and energy. The human body is a pure machine and its functions depend upon a supply of heat and energy just as much as a boiler or an engine. Foods furnish heat in varying quantities as already indicated. Starch and sugar furnish about 4,000 units of heat per unit of weight; proteid matter, if completely burned, furnishes about 5,500 units of heat per unit of weight; fats, when completely burned, furnish about 9,300 units of heat per unit of weight. In point of fact, however, proteid matter is not completely burned in the body, and a considerable amount of nitrogen is excreted without being reduced to the last state of oxidation. Hence, proteid matter does not furnish any more heat during the process of digestion and assimilation than an equal amount of carbohydrates, so that the heat value of a proteid, in so far as the human machine is concerned, is practically the same as that of a sugar or a starch, while the value of a particle of fat is two and a quarter times greater than that

under high pressure. The apparatus is so arranged that by means of platinum wire, or other appropriate device, the food substance may be ignited in the atmosphere of oxygen and burned completely into final forms of oxidation, producing water, carbon dioxide, nitric, phosphoric and sulphuric acids, according to the relative quantities of the various constituents present. Before igniting the particle of food, the whole apparatus is set in a measured quantity of water at a known temperature and the rise of temperature attained is carefully noted by a standard thermometer. This apparatus is called a calorimeter. In this manner the accurate data which have been mentioned are obtained.

**The Body a Furnace.**—An exactly similar process goes on in the human organism, though slowly, and experiments have shown that the data obtained by the calorimeter are entirely comparable with those obtained in the organism. This has

**Balanced Ration.**—Experience has shown that man eats from choice certain quantities of the kinds of food mentioned, and in a certain definite proportion. While the dietaries of different nations differ, it may be stated that men in the same ranks of life, having practically the same means of obtaining subsistence, live in a uniform manner the world over. It is possible, therefore, by experience and study to determine the normal diet of man. The total quantity of food which a man eats is usually determined by the heat units mentioned and known as *calories*. The average man eats an amount of food which produces a quantity of heat recognized by the expression *three thousand calories*. That is, if the food which the average man eats were burned, it would raise a unit volume of water from zero to a temperature of three thousand degrees. As water could not bear such a temperature, however, a better expression is that the food of an average man per day would raise the temperature of three thousand unit weights of water one degree.

A study of these data show that not only is the human organism a machine but it is the most economical machine known. This is true of the animal organism in general and not of the human system in particular.

A balanced ration may be regarded as that quantity of food which will furnish three thousand units of heat, and so distributed among the various kinds of foods as to secure the proper proportions of protein, carbohydrates, minerals, condiments, and fats. This quantity of food, if deprived entirely of its water, represents about one per cent of the weight of the individual eating it. In other words a man weighing 150 pounds in ordinary circumstances, and at light physical employment, eats one per cent of his weight of dry food a day, that is, one and a half pounds of dry food. As the ordinary foods used, however, contain about three times as much water as they do of dry substance, the total weight of food, including water, used by the average man of 150 pounds, is from four to five pounds per day.

**Average Distribution of the Dry Food.**—Assuming that the average man eats one and a half pounds of dry food per day, experience has shown that this is distributed in about the following proportions:

Proteid..... 0.25 lb.  
Fat..... 0.2 lb.  
Carbohydrates..... 1.0 lb.  
Mineral matter, etc..... 0.05 of a lb.

The above data are to be considered only as approximate expressions in round numbers of the general distribution of the diet of an ordinary person.

**Adulteration of Food.**—Adulteration of food has been largely practiced for the purpose of commercial gain. In so far as nutrition and palatability are concerned, and from the common point of view of the consumer, there is no possible excuse for adulteration of any kind. The sole purpose of the practice of adulteration is to secure unearned profit for the manufacturer and dealer. Adulteration of food is practiced in various ways, the most common of which are as follows:

- (a) *The abstraction of some valuable ingredient.* This is illustrated in the skimming of milk and the sale of the product as a whole milk.
- (b) *The addition of some agent which dilutes or weakens the product.* This is shown in the addition of water to milk;

### COMPARATIVE FOOD VALUES

FOOD MATERIALS	Protein.		Fats.		Carbohydrates.		Fuel Value.	
	Cents.		Cents.		Cents.		Cents.	
	Per lb.		Per lb.		Per lb.		Per lb.	
	10 cents worth.		10 cents worth.		10 cents worth.		10 cents worth.	
	1 lb.	2 lbs.	1 lb.	2 lbs.	1 lb.	2 lbs.	1 lb.	2 lbs.
	2000 Cal	4000 Cal	2000 Cal	4000 Cal	2000 Cal	4000 Cal	2000 Cal	4000 Cal
Beef, round	14	.71						
Beef, sirloin	20	.50						
Beef, shoulder	12	.83						
Mutton, leg	16	.63						
Pork, loin	12	.83						
Pork, salt, fat	12	.83						
Ham, smoked	18	.56						
Codfish, fresh, dressed	10	1.00						
Codfish, salted	7	1.43						
Oysters, 35 cts. per quart	18	.56						
Milk, 6 cents quart	3	3.33						
Butter	25	.40						
Cheese	16	.63						
Eggs, 24 cents dozen	16	.63						
Wheat bread	5	2.00						
Wheat flour	3	3.33						
Cornmeal	2½	4.00						
Oatmeal	4	2.50						
Beans, white, dried	5	2.00						
Rice	8	1.25						
Potatoes, 60 cents bushel	1	10.00						
Sugar	6	1.67						

of either a proteid or a carbohydrate. **The Calorimeter.**—A simple method of calculation is pursued in measuring heat value. A particle of food is inclosed in a strong steel vessel, called a bomb, and into this vessel oxygen is pumped

been proved by inclosing a human being in a tight compartment by means of which all the heat and all the products of combustion which are produced in his organism are measured. This experiment shows how complete a machine the human organism is.

of chieftain to coffee; of ground shells to pepper and other spices, etc.

(c) *The concealing of inferiority of a product.* This is done chiefly by coloring or bleaching, as for instance, the use of color in a distilled vinegar to make it appear like cider vinegar; the addition of an artificial flavor to an extract to make it resemble the genuine article; the bleaching of flour to make it look like high-grade patent flour, etc.

(d) *The addition of a substance to a food product which may render it injurious to health.* This is practiced chiefly for the purpose of preserving foods, though some of the coloring matters employed are undoubtedly injurious to health, such as sulphate of copper and many coal-tar dyes. Many authorities on hygiene are of the opinion that any kind of a preservative drug added to a food product is injurious. The reason for this belief is that a preservative only acts by destroying or paralyzing germ life and a preservative is only effective when enough of it is added to secure this effect. It is a very common opinion among experts, especially those charged with the protection of the public health, that all such practices are objectionable. On the other hand, there are experts, also eminent in their professions, who maintain that the use of preservatives is not deleterious. All nations that have food laws have either forbidden or restricted the use of these preservative materials, and this shows that the feeling of the community is decidedly opposed to them. When it is further considered that every kind of food which is suitable for human consumption may be perfectly preserved in some unobjectionable way without the use of preservatives, it is evident that their employment is wholly unnecessary and, therefore, always objectionable.

**Misbranding of Food Products.**—Almost as objectionable as adulteration is the practice of misbranding. As in the case of adulteration, this is done solely to secure undeserved profits on the part of the manufacturer or dealer. From the consumer's point of view there can be no excuse offered for the misbranding of foods. This misbranding takes various forms of which the following are some examples:

(a) *Misbranding as to the state or country in which the food is produced,* as, for instance, representing a domestic wine as of foreign manufacture, either by name or other device.

(b) *The giving of a false or fictitious name of manufacturer.* This is a very common practice among those who make different grades of products. Their own names are placed on the high grades and the names of fictitious firms on the low grades.

(c) *The calling of adulterated food by the name of the real article,* which is probably the most common form of misbranding, and is illustrated in the sale of milk which has been skimmed and watered as milk; a buckwheat flour which has been mixed with other materials as buckwheat flour, and maple sirup mixed with other sweets as maple sirup.

(d) *The misrepresentation of the qualities of a food product under another form of misbranding.* It is not uncommon to see advertisements calling attention to "superior qualities" which the article does not possess, such as "the most wholesome," "best made," "entire substitute for," etc. A most dangerous practice, and one which threatens health and often life, is found in

the claims made for certain varieties of infants' and invalids' foods. Another very common form of misbranding is where long stored foods are advertised as fresh—a form of misbranding which is now receiving attention in all the countries of the world, and regulations are being made looking to the minimizing of this evil. Infants' and invalids' foods of all others, should be pure, wholesome and free from misbranding and adulteration.

**ENTOMOLOGY.**—The branch of zoology which treats of the insects. The true insects are those animals of the division *Arthropoda* or *Articulata* distinguished from the other classes of the division by the fact that the three divisions of the body—the head, thorax, and abdomen—are always distinct from one another.

There are never more than three pairs of legs in the perfect insect, and these are all borne upon the thorax. The wings are expansions of the sides of the second and third sections of the thorax, and are attached by slender tubes called *nerve*s. In the beetle the anterior pair of wings becomes hardened so as to form protective cases for the posterior membranous wings, and are called in this condition *elytra* or *wing-cases*. The head is composed of several segments amalgamated together, and carries a pair of feelers or *antennae*, a pair of eyes, usually compound, and the appendages of the mouth. The thorax is composed of three segments, also amalgamated, but generally pretty easily recognized.

The organs of the mouth take collectively two typical forms, the masticatory and the suctorial, the former exemplified by the beetles, the latter by the butterflies, in which the mouth is purely for suction.

Generally the young are very different from the full-grown insect, and pass through a *metamorphosis* before attaining the mature stage. When this metamorphosis is complete it exhibits three stages—that of the larva, caterpillar, or grub, that of the pupa or chrysalis, and that of the imago or perfect winged insect.

**Classification.**—Insects have been divided into three sections—*Ametabola*, *Hemimetabola*, and *Holometabola*, according as they undergo no metamorphosis, an incomplete one, or a complete one.

**Ametabola.**—The young of the *Ametabola* differ from the adult only in size. They are all destitute of wings; the eyes are simple and sometimes wanting. This section is divided into three orders—*Anoptera* (lice), *Mallophaga* (bird-lice), and *Thysanura* (springtails).

**Hemimetabola** undergo an incomplete metamorphosis, the larva differing from the imago chiefly in the absence of wings and in size. The pupa is usually active, or if quiescent capable of movement. The section *Hemimetabola* comprises the orders *Hemiptera* (cicadas, bugs, plan-lice, etc.), *Orthoptera* (cockroaches, crickets, grasshoppers, locusts, carwigs, etc.), and *Neuroptera* (dragon-flies, May flies, white ants, etc.).

In the *Holometabola* the metamorphosis is complete, the larva, pupa, and imago differing greatly from one another in external appearance and habits. The larva is wormlike and the pupa quiescent. The *Holometabola* comprises the orders *Aphaniptera* (fleas), *Diptera* (gnats, botflies, gnat-flies, mosquitoes, house flies, etc.), *Lepidoptera* (butterflies and moths), *Hymenoptera* (bees, wasps, and ants), *Strepsiptera* (stylops, minute and parasites), and *Coleoptera* (lady-birds, glow-worms, cock-

chafer, weevils, and all of the beetle tribe). [See Dictionary of Animals.]

**ETHNOLOGY.**—Anthropology is that science which studies man. Taken in its most comprehensive significance it includes so great and such diverse material that it is necessary to subdivide it. Four main divisions are usually recognized—*somatology*, *ethnology*, *ethnography*, *culture history*. *Somatology*, sometimes called *physical anthropology*, considers man as a living organism, in himself and in his relations to other animal forms. It involves, anatomy, physiology, psychology. *Ethnology* and *ethnography* deal with races; the former is a philosophical, the latter a descriptive science. The difference between them is the same as that between *geology* and *geography*.

**Place Among Sciences.**—*Ethnology* is based on *somatology*; it defines the different races of mankind; it studies the great questions of origin, variation and distribution. *Ethnography* describes the different populations of mankind; it seeks to give a definite picture of the life and culture of each and every division of the human race; it deals little in theories, much in facts. *Culture history* studies the development of culture from lowest savagery to highest civilization; it is constructed from the facts supplied by *ethnography*.

**The Scope and Field of ethnology** may be briefly indicated. The philosophical study of the human race involves investigation of the origin of mankind; it attempts to reconstruct the primitive type of man; it aims to locate man's first home; it defines the definite types and varieties of the human species; it seeks to follow the movements of mankind from its first home, and to present the facts of the present distribution of human varieties.

**Origin of Man.**—To-day, science assumes evolution as an underlying principle. Man is commonly recognized as an exception to the general rule. He is part of animate creation, and is related by genuine ties of blood with other animals. His closest relatives are the various species of anthropoid apes living to-day in Africa, in southeastern Asia, and the adjacent islands. There are four types which so much resemble man as to deserve the name of anthropoid apes—the gorilla, chimpanzee, orang-utan, and gibbon. The gorilla and chimpanzee live in tropical Africa; the orang-utan and the gibbon live in the islands southeast from Asia, and in the neighboring portions of the continent. The gorilla is the largest of the four types, the different gibbons the smallest; all resemble man, but perhaps the nearest approach is in the chimpanzee and the orang-utan. Neither Darwin nor his followers have claimed that man is descended from any of the living types of anthropoids; they and he alike have descended from a common ancestor; they are collateral relatives.

**Unity of Mankind.**—The old question of monogenesis is no longer one of serious importance. Monogenesis is the doctrine that all men have descended from a single stock; that all are of one blood. The counter-proposition that the different races of man have absolutely different origins, that they are different in blood, that all men are not brothers, is called *polygenism*.

In the early days of ethnology the battle between these two views was bitter. Naturalists held the fixity of plant and animal species. It was recognized that within the range of a single species there might be



alike. When we compare the different ethnological schemes with one another, we usually find that they meet both these ends with fair success. All bring together groups which are alike, and but rarely do natural relationships of peoples seem to be disjointed.

We should recognize the same differences that Keane does, but shall apply to them the terms *Ethiopic*, *Mongolic*, *American*, and *Caucasic* races.

**Characters of Race.**—Topinard attempted to define the race types of the world. His study was the most careful and precise undertaken to that time. He based his types of races absolutely upon physical characters and made five features fundamental. These were the *stature*, *head form*, *nose*, *hair*, and *color*.

**Stature.**—In stature, man ranges from the tall Patagonian, with an average of six feet or more, to the pygmies of central Africa and the Negro of the Asiatic archipelago. Among all races there is no difference in stature, and, in general, it may be said that the female will average one-sixteenth less than the male. In stating that any race or people is of a given stature it is meant that the average of stature in adult males is to be understood. The average stature of mankind is perhaps 1.65 meters.

The term *pygmy* is applied to the populations of smallest stature and the French writers have agreed to call all populations *pygmy* where the average stature of adult males does not exceed 1,500 millimeters. Sir William Flower set the limit for pygmy stature in English measure at 5 feet, which is practically the same thing. The ethnologist divides people on the basis of stature into tall tribes (1,700 mm. and up) medium (1,600 to 1,699 mm.) and short (below 1,600 mm.).

**The Head Form** is difficult to define in words. To convey it to the mind, certain measures are taken and a numerical statement made. The two most important head measures are the length and breadth. Actual length and actual breadth, however, have but little value, and it is common to compare the two, expressing the ratio between them in what is known as an index.

Two head indices are commonly employed, one of which expresses the relation between the length and breadth of the skull and the other the relation of length and breadth upon the living subject. To the former the name *cranial index* is given; to the latter that of *cephalic index*. These indices are found by the same method, which is to divide the breadth by the length and drop the decimal point. Thus, if a skull measured eight inches in length and six inches in breadth, the cranial index would be 75. If, on a living head, the length were seven and one half inches and the breadth five inches, the cephalic index would be 66½. There are no normal skulls with an index so low as 50 or so high as 100; i. e., there are no normal skulls which are twice as long as they are broad, or which are as broad as they are long.

The indices are constantly employed in the defining of human races. The actual range as found in the averages of races is 69.4 to 88.7. Special terms are used to indicate the head form. Thus brachycephalic (85.3 and up), mesocephalic (85.2 to 77.1), dolichocephalic (below 77.1). The Arnenians are for the most part brachy-

cephalic with an index of 85.6; the Eskimo are dolichocephalic (76.8).

**Nose.**—The form of nose is one of the best distinguishing characters of race. Here again, an index is calculated from two measurements—height and breadth. The nasal index is found by dividing the breadth of the nose by the height and dropping the decimal point. The range is from 69.4 to 107.9. A nose as wide as it was high would have a nasal index of 100; one which was half as broad as high an index of 50. Individuals with an index of 100 or more are not uncommon among negroes.

On the whole, the white peoples of Caucasian race have the narrowest and most prominent noses. Three terms are used in connection with the nasal index—leptorhinian (below 70), mesorhinian (70 to 84.9), platyrhinian (85 and up). The northern type of European is leptorhinian, the Negro of the Philippines is platyrhinian.

**Hair** is one of the most distinctive marks of race. Huxley made it fundamental in his classification, and recognized two main divisions of mankind—the straight haired and the woolly haired. Various points should be observed regarding it. As regards its general form, hair may be straight, wavy, curly, crinkly or woolly. In cross section, it may be circular, oval or elliptical, or flattened. White peoples, generally, have hair oval or elliptical in cross section; yellow peoples have hair with circular cross section; and blacks have distinctly flattened hair.

Hair differs racially in diameter, texture, abundance, distribution and angle of emergence. There are marked differences between races in the matter of calvity (baldness) and canity (graying). There are notable differences also in distribution and in the quantity and development of face hair. In color, race differences of hair lead to the employment of the terms black, brown, medium, light and blond. Red hair is found exceptionally among all races, but is typical of some sub-types. There are actually two types of red hair, one of which is blond, the other a variety of black.

**Skin Color.**—The color of the skin varies with race. Its differences are so striking that they have attracted universal attention and in many attempts at classification the color basis is fundamental. It is difficult to suggest a serviceable series of color terms. There are no actual black populations and no truly white ones. For a careful discrimination, color scales are necessary, and ethnologists quite generally use a series of fixed color samples which they match with the skin of the subjects studied. The best known chromatic scale for use in race study is that of Broca, where some thirty-four shades are discriminated. In ordinary practice a list of half a dozen terms is employed.

**Four Great Races.**—The four great races may be characterized as follows:

**Ethiopic.**—Color, from brown to almost black; generally dolichocephalic; forehead, frequently retreating with heavy arches over the orbits; prognathic—i. e., the lower part of the face notably projecting; the cheek bones do not project notably forward and anteriorly; the nose is broad and flattened, platyrhinian; the eyes are large and prominent and lustrous, dark brown or black in color; the hair is black, frizzly or woolly; and presents a flattened cross section; the

stature is above the average of mankind at 5 feet 10 inches. The pygmy populations differ from the normal Ethiopic type in stature, in head form, tending toward brachycephaly, and in hair color, frequently a reddish brown.

**Mongolic.**—Color, a lighter or darker yellow; brachycephalic; the forehead fairly developed and without conspicuous orbital arches; the general impression given by the face is flatness and broadness with prominent forward development of the cheek bones; the nose is generally small and mesorrhine; the eyes black, with narrow almond-shaped opening, which appears to be oblique on account of a fold of skin at the inner edge; hair black, lank, coarse, circular in cross section; stature below the average at 5 feet 4 inches.

**American.**—Color, brown with a reddish or yellowish tinge; mesocephalic; large, coarse features; forehead well developed and usually slight prognathism; cheek bones are prominent; nose mesorrhine, prominent, large, often aquiline; eyes small, round, straight, sunken, black; hair, black, lank, coarse, long, round; the face is usually beardless and there is little body hair; stature above the average at 5 feet 6 inches.

**Caucasic.**—Color, ranging from white to almost black and presenting in white peoples distinctly fair and dark varieties; both types of head form occur, combined with both fair and dark colors; the face usually harmonizes in its form with the head form; prognathism rare; cheek bones not projecting; leptorhinian; eyes straight, rather large; hair, varying in color from light gray or blue to dark brown or black; hair, wavy, oval or elliptical in cross section, varying from flaxen to black; beard usually developed and body hair abundant; stature variable from tall to average.

**The Ethiopic Race** may be divided into continental and island divisions. The continental blacks occupy Africa from the Sahara desert southward. The insular group is found in Melanesia and it is customary to add the native population of Australia to this race. Both on the continent and in the islands, two sharply contrasted types are found—the large negroes and the small, or pygmy, populations.

**Pygmies.**—The pygmies present the typical hair, features and general character of the race, but in the average of adult males fall below 5 feet in stature. In central Africa they occur in little groups scattered over a wide area in the midst of large black peoples. They have practically no agriculture and depend on the chase for food, representing the culture stage of savagery. Their hair is frequently of a reddish or grayish brown. They are not to be considered a dwarfed or degenerate population, but a well-developed and active people of a type among the oldest known.

A curious condition of commensalism usually exists between these little people and their large neighbors. The populations among whom they live are settled agricultural peoples, living in large and well-built villages. The pygmy settlements are usually at the edges of these towns, and a constant trade exists between the two groups; the little people bring fresh meat, ivory, honey and other natural products and receive in trade field products, cloth, and iron.

To the little blacks of the island world, of whom those living in the Philippines

are typical, the name "Negrito" is usually applied. They present the same physical peculiarities, stage of culture, and mode of living. They live in practically the same relations with the neighboring Malays that the pygmies do with their large neighbors.

**Busmen.**—It is customary to group the Bushmen of southern Africa with the pygmies. They present some interesting points of difference. Their skin has a distinct yellowish tinge; they live in little wandering groups, taking refuge in caves and rock-shelters; they are hunters, but there is no distinct commensalism between them and their Bantu neighbors; their delight to mark their cavern walls with crude but lively representations of the animals they pursue. These peculiarities, to a less degree, mark the pygmies of central Africa. They are also found in the Hottentots, neighbors of the Bushmen, usually considered to be the result of intermarriage between them and the Bantu of the region.

**Negros.**—The large continental blacks have reached the stage of barbarism in culture, and live in good towns, depend upon the product of the fields (cultivated by women), or, especially toward the south, upon herds of cattle. Two great divisions are recognized—the true negro of the Soudan district and the Bantu populations farther south.

In the true negro the characteristics of the race already mentioned are carried to their fullest development; blackness, coarseness of features, flatness of nose, prognathism with accompanying thickness of lips, and dolichocephaly are emphasized in them. The Bantu present a fine, chocolate brown tint, more regular and, to the eye, pleasing features; prognathism is rarely pronounced and the head is by no means markedly dolichocephalic.

**Melanesians.**—In the islands, the large blacks include the Papuans of New Guinea and the Melanesians of Fiji, New Caledonia, the Solomons and other island groups. Their life is interesting and has been the subject of much study. Dark colored, woolly haired, dolichocephalic, platyrrhine and of good stature, they are actually comparable with the big blacks of Africa.

**The Mongolic Race** is the most populous of the divisions of mankind. There is reason to believe that of the great races it perhaps nearest approaches the primitive stock of humanity. It is vigorous, hardy, and expansive. Its primitive home is the great continent of Asia, which is still chiefly occupied by it. The race presents two chief divisions to which Keane gives the names Mongolo-Tatar and Tibeto-Indo-Chinese.

**The Mongolo-Tatar** is the northern in position. It has spread from Asia across northern Europe and occupies to-day the north of Russia and a considerable area in Scandinavia. To it belong the great wandering borders of Siberia—Mongols, Kalmyks, Buriats, Tungus, Yakuts and the like; to it also belongs the great Finn-Tatar group—with Tatars, Turki, and Ugrians. To this belong the Finns, Magyars and Bulgarians. In the far north are the Samoyeds and Lapps, the latter a people of small stature, who raise reindeer in the north of Sweden and Norway. To the great Mongolo-Tatar mass also belong the Koreans and the Japanese, relatives in blood and language. The Koreans are relatively pure Mongols, the Japanese much mixed with other elements, as we shall later see.

**The Tibeto-Indo-Chinese** division includes the Tibetans, the Chinese proper and the great mass of people in Indo-China and southeastern Asia, such as the Siamese, Burmese and the people of Annam. They are sedentary peoples, depending upon agriculture, with towns and cities, a dense population with distinctive culture, a true civilization. Linguistically, the southern group differs profoundly from the Mongolo-Tatar. Chinese and Japanese represent totally different types of language.

**Eskimo.**—Besides the two great divisions mentioned, the Mongolic race includes two interesting extra-continental groups—the Eskimo and the Oceanic Mongols, or Malays. Taxonomically, the Eskimo present a difficult problem. In color, face, features, stature—in fact, in the whole general impression—they are clearly Mongolic. But they are at the same time dolichocephalic; the Eskimo skull is one of the most sharply marked; it is long and narrow, has square jaws and ridged vault to the degree that, viewed directly from in front, it gives a distinct pentagonal outline.

The Eskimo occupy the whole arctic coast of North America from south and western Greenland to the western end of Alaska and overlap into eastern Asia. Throughout this enormous range of thousands of miles they present remarkable uniformity in type, language, and mode of life. The area occupied is chiefly American, not Asian; and the bulk of Eskimo population is found in the new world.

**Malays.**—The Oceanic Mongols, or Malays, occupy the islands of Malaysia, the Malay peninsula and a part of the great island of Madagascar off the east coast of Africa. Blumenbach considered the Malay one of the fundamental populations of mankind. It presents a fairly well-defined type, which, however, may be included in the Mongolic. The Malays and the Malayan peoples (for the word "Malay" proper is used chiefly in ethnology for those in the peninsula) are good seamen.

**The American Race.**—Keane refuses to recognize the Malays as distinct, but insists upon separating the American type from the Mongolic. For him they are an offshoot, but one of ancient date, which has had ample chance to develop peculiar characteristics in the American area. Contrasted with the other great races it presents a notable degree of physical uniformity. Writers have often said: "When you have seen one American Indian you have seen all!" "The American Indian presents the same type from the cold waters of the Arctic to the cold waters of Cape Horn."

This uniformity is striking but not absolute. Careful study shows tall and short tribes of American Indians, from the Patagonians, who are perhaps the giants of mankind, to Otomi, who almost touch the limit of pygmy height. There are long headed and short headed tribes, light and dark—from almost black to almost white; there are tribes with large faces and coarse features, like the Sioux, and tribes with soft and mild faces and delicate features, like the Chinantecs.

The American Indians present a notable uniformity in culture and it may be said that as a whole they are in barbarism. They represent every degree of barbaric culture from the lowest to the highest, and it may almost be said that not a single tribe of the many hundreds of American Indians represents either savagery or civilization. The rudest Athabascans of

British America had reached lower barbarism and the Asteas and Mayas of Mexico fall just short of civilization. While writers usually have claimed a single origin for the American peoples, it seems more reasonable to assume that immigrants have come by many routes from many regions. Within the new environment the fragments of old populations have approximated to each other until we have the present condition of relative uniformity.

**The Caucasian Race.**—The continent of Europe is chiefly occupied by people of Caucasian race. Light whites and dark whites are readily distinguished. No section of the world has presented more serious problems to the ethnologist and no race is more difficult of satisfactory discussion than the Caucasian.

So far as Europe is concerned, Ripley recognizes three races: the northern, which is fair, tall, dolichocephalic; the Alpine, which is short, dark, and broad headed; the southern or Mediterranean, which is short, dark and long headed. This classification is attractive for its simplicity. It seems indeed to be too simple, and with its acceptance, points of importance are lost from sight and real distinctions fail to be recognized. Deniker recognizes ten types of European whites speaking Aryan tongues, which he groups under six races and four sub-races. His characterization of these types is as follows:

- I. **Northern.**—Very lofty stature (5.73m.); dolichocephalic (73-79); fair; wavy hair sometimes reddish light eyes, usually blue; muddy white skin; long face; prominent, straight nose; e. g., Swedes.
- A. **Sub-Northerly.** Tall; mesocephalic; fair; straight hair; angular face; turned-up nose. e. g., Lithuanians.
- II. **Eastern.**—Short (1.63 m.); moderately rounded-headed (82-85); fair; straight light-yellow or fawn hair; light eyes; away skin; e. g., Russians.
- A. **Vulgaris.**—Very short; mesocephalic; fair; e. g., Poles.
- III. **Ibero-insular.**—Short (1.61 - 1.63 m.); dolichocephalic (73-76); dark; hair black, often curly; very dark eyes; away skin; straight or turned-up nose; e. g., Spaniards.
- IV. **Western, or Cevenole.**—Short (1.63-1.64 m.); very rounded skull (83-87); dark; brown or black hair; light or dark brown eyes; rounded face; thick-set figure; e. g., central French.
- V. **Littoral, or Atlantic-Mediterranean.**—Tall (1.66 m.); moderately dolichocephalic or mesocephalic (79-80); dark; hair and eyes very dark colored. Always near the Mediterranean coast.
- A. **Northerly.**—Tall; sub-dolichocephalic; chestnut hair, often brown; e. g., Welsh.
- VI. **Adriatic, or Dinaric.**—Tall (1.68 - 1.72 m.); brachycephalic (85-88); dark; brown or black wavy hair; dark eyes; straight eyebrows; elongated face; delicate, straight or aquiline nose; slightly away skin; e. g., Montenegrins.
- A. **Sub-Adriatic.**—Tall (1.66 m.); less brachycephalic (82-85); lighter hair and eyes; e. g., Luxemburgers.

There are truly European types, speaking related languages.

**Non-Aryan Whites.**—There are however other Caucasian peoples; thus, in the region of the Caucasus itself, a district of extraordinary mixture and ethnic confusion, are many interesting peoples. It is from this district of Georgians and Circassians that the name applied to the whole race was drawn. The Basques of the Pyrenean district, divided politically into French and Spanish Basques, are white men, Caucasian, European, but not included in Deniker's types, being unrelated in language to the races of Aryan Europeans.

The whole of north Africa is occupied by peoples who are neither Ethiopic nor Mongolic, and who, though dark in skin for the most part, are regularly classed in the Caucasian race. Although, in their entirety, the general name Hamitic is given to them, some of them have been profoundly



influenced by Semitic peoples and languages.

Many fine types occur within this area, which, of course, includes the Egyptians, past and present, the Libyans and the Berbers. While these peoples are for the most part dark, some remarkable groups of notably blond types occur among them. That these blond types are ancient is clearly shown by the wall-paintings of old Egypt, where the Libyan is regularly represented as blond. To the Caucasian race belong also the brunette populations, ancient and modern, who speak the pure and typical Semitic languages—Hebrews, the modern Arabs and their neighbors. With them, we enter Asia.

**Asiatic Caucasians.**—In Asia, also, are Caucasian peoples, some of them speaking Aryan languages, in Persia, Afghanistan, and parts of India. Caucasian elements in Asia date far back, and there is good evidence of their existence and influence even in that section of the great continent which is occupied by Mongolo-Tatar populations.

The Ainu of Yezo and Saghalien are a Caucasian people. They are the remnant of the aboriginal population of Japan. Perhaps they occupied the entire archipelago before the coming of the Japanese from the continent by way of Korea. They are dirty white in color, have abundant wavy hair, elliptical in cross section, horizontal, large expressive eyes, almost European features, abundant body hair and heavy beards. They are mild in disposition and in culture are almost in savagery. Their language differs notably from Japanese in structure and lexicon.

In India are the Todas, whom Keane considers Caucasian. In face, features, hair and heavy beards, in yielding character, they present considerable analogy to the Ainu. They are, however, cattle raisers, and their wild life is wrapped up in the care of their animals. There are in other parts of Asia scattered fragments of populations which one and another writer have suggested are Caucasian and it is not impossible that continuous populations of inoffensive and weak Caucasian type once occupied the whole of eastern Asia and

that they have been broken and separated by the flood of Mongolians coming from the west. The present tendency is to recognize the existence of Caucasian people in the island world.

**Indonesians.**—The term "Indonesian" is much used for certain people of Malaysia who do not present the true ("Malay") Mongoloid type. It is assumed by those who use the term that these Indonesians are in large part Caucasian, modified by Malay or other island blood. The Polynesians, too, are largely claimed at present as Caucasian. These peoples present a handsome, attractive type; of good stature, well built, with faces of regular features, they are beautiful, by our standards.

**Geographical Distribution.**—In general, each continent has a distinct type of mankind. Asia has its Mongoloid type; Europe and northern Africa its Caucasian type; south Africa its Ethiopian type; and the double continent of America its American type. Even Australia has a definite race type. While this is true, there has been so much of movement, interpenetration, and admixture that the population of no great land area is now uniform.

**European Peoples.**—Europe, with northern Africa, is the true home of the Caucasian race, but contains Mongoloid peoples as well. In the accompanying table of European peoples by countries the main or fundamental population is given in one column, the more important secondary elements in another.

**Asiatic Peoples.**—Asia is the continental home of the Mongoloid race, which still forms the greater part of its population, but a large Caucasian element has been present since ancient times and there is local mixture of Ethiopian blood. Deniker recognizes eleven physical types, which have intermingled to produce the Asiatic peoples of to-day. Five of them are peculiar to Asia—Dravidian, Aryan, Indo-African, Ainu, Mongolian; six occur elsewhere—Negrito, Indonesian, Arab, Egyptian, Turkish and Eskimo. Six of these are Caucasian—Dravidian, Aryan, Indo-African, Ainu, Indonesian, Arab; four are Mongoloid—Mongolian (Tibeto-Indo-Chinese), Ugric (Mongolo-Tatar),

Turkish (Mongolo-Tatar), Eskimo; one is Ethiopian—Negrito.

**Dravidian** appears to be the brown aboriginals of south India, who are short of stature, dolichocephalic and with curly or wavy hair. Pechel made of them a great race type. Their position among races has been disputed, but in our four-race classification they must be called Caucasian.

**Aryan** is so called because the type is common in the wall sculptures of old Assyria. It is well characterized, with tawny-white skin, narrow hooked nose with thick lips, brachycephalic, hair wavy or curly. It is the Armenian type and the oft-mentioned "Jewish" type is fundamentally Aryan. In our scheme it is Asiatic Caucasian. So, too, is Indo-African, the type of the invading conquerors of part of India. It has clear brown skin, black wavy hair, narrow straight or convex nose, dolichocephaly, tall stature.

The Arab, typical Semite—though the word Semite is properly linguistic, not ethnic—is dark, with black wavy hair, dark eyes, long elliptical face, dolichocephalic head, aquiline nose, prominent occiput.

**Jew.**—This term should be used in only a religious sense; in so far as it has ethnic application it is fundamentally Aryan or Arab or both; but it is everywhere mixed and approximates the people of the surrounding populations. Jews, of course, exist the world over. Gypsies, also world-wanderers, probably began in India and are Indo-African, at least in part.

**African Peoples.**—To draw up similar tables of the population of other continents would be more difficult and less satisfactory. The population of Africa falls into two well-marked divisions. Northern Africa to the Sudan must be ethnically joined to Europe. Brinton emphasized this fact by making one continent of the two land masses, to which he gave the name Eurafria. Its population is Caucasian, though many of its peoples are dark of skin. In features, head-shape, hair, nose, they are clearly related to European peoples. Among them are Berbers, Libyans, Egyptians, Nubians, Abyssinians. Collectively these north-African peoples are called Hamitic but they have been

Table of Peoples of European Countries

COUNTRY	CHIEF OR FOUNDATION PEOPLES	SUBORDINATE OR LOCAL
Austria.	Northern.	Western. In south, Adriatic.
Belgium.	Northern (Flemish). Western (Wallon).	Northwestern.
British Isles.	Northern, Subnorthern.	Northwestern; in Wales and Ireland.
Bulgaria.	Bulgars. (Mong.—Turko-Finn.)	Mixed with Slav elements.
Denmark.	Northern.	Along coast, Western.
France.	Western or Cevenole, in highlands.	Northwestern, in northern lowlands. Littoral in south, Adriatic.
Germany.	Northern, in lowlands.	Sub-Adriatic. Western.
Greece.	Diversified and uncertain.	Littoral. Western.
Italy.	Adriatic in north. Ibero-Insular in south.	
Montenegro.	Northern. Subnorthern.	
Netherlands.	Northern. Lapps, etc.	Sub-Northern and North-
Norway.	(Mong.) in north. Ibero-Insular.	Mixed with Slav elements.
Portugal.	Turki (Mong.). Western elements.	Northwestern.
Roumania.	(Cauc.) Northern. Sub-Northern. Eastern.	Viethian (Poles). Adriatic.
Russia.	(Mong.) Lapps. Finns. Samoyeds.	
Serbia.	Adriatic.	Western, north coast; Littoral, south coast.
Slovenia.	Ibero-Insular.	Subnorthern and North-
Sweden.	Northern. Lapps and Finns.	Mixed with Slav elements.
Switzerland.	Cevenole, or Western.	Adriatic. Sub-Adriatic.
Turkey.	Turki (Mong.).	

Table of Peoples of Asiatic Countries

COUNTRY	CHIEF OR FOUNDATION PEOPLES	SUBORDINATE OR LOCAL
Afghanistan.	Indo-African (Cauc. of Aryan speech).	Aasyroid (Cauc.).
Arabia.	Arabs. Syrians (Cauc.—Semitic).	
Baluchistan.	Baluchi (Cauc.—Indo-African).	Arab. (Cauc.—Semitic).
Burma.	Burmese.	Negroid.
China.	Chinese. (Mong.—T.-I.-C.).	(See Indo-Chinese).
India.	In north, Mongoloid.	Lolo, Maniche, (perhaps Caucasian). (Other fragments of aboriginal peoples).
Indo-China.	Ganges and Indus valleys, Aryo-Dravidians. In south, Dravidians. Cambodians, Annamese, Burmese.	In Punjab—Deccan; Brachycephal Caucas.; Ceylon; Veddas, aborigines (Cauc.).
Japan.	Japanese (Mong.—K.-J.).	(Aboriginal "Indonesians" mixed with incoming Mongoloid peoples).
Korea.	Koreans (Mong.—K.-J.).	Negrito.
Persia.	Persians (Cauc. of Aryan speech).	Ainu (Cauc.). Much Malayan influence.
Siam.	Siamese (Mong.—T.-I.-C.).	Trace of Caucasian elements.
Siberia.	Mongolo-Tungus, Tatars, Yakuts, etc.	Semites (Cauc.). Turki (Mong.—M.-T.). (See Indo-Chinese).
Tibet.	Tibetans (Mong.—T.-I.-C.).	
Turkey.	Turki (Mong.—M.-T.).	Aasyroid (Cauc.).





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|--------------------|-------------------|--------------------------------------|---|-------------|--|--|--|--|
| 1. Agates.         | 11. 13. Rubies.   | 19. Free Crystals.                   | 21. 26. 27. Topaz.  | 28. Garnet. | 30. Garnet.  |  |  |  |
| 2. 3. 4. Emeralds. | 14. Conglomerate. | 16. 17. 18. 19. Cluster of Crystals. | 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919. 920. 921. 922. 923. 924. 925. 926. 927. 928. 929. 930. 931. 932. 933. 934. 935. 936. 937. 938. 939. 940. 941. 942. 943. 944. 945. 946. 947. 948. 949. 950. 951. 952. 953. 954. 955. 956. 957. 958. 959. 960. 961. 962. 963. 964. 965. 966. 967. 968. 969. 970. 971. 972. 973. 974. 975. 976. 977. 978. 979. 980. 981. 982. 983. 984. 985. 986. 987. 988. 989. 990. 991. 992. 993. 994. 995. 996. 997. 998. 999. 1000. | 30. Garnet. | 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. | 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. | 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. | 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. |

strongly influenced by Arab (Semitic) hordes which have swept over the area.

On the southern border there is much mixture with negro blood. To the rest of Africa, Britton applies the name *Aust-Africa*. It is divided between true negroes in the north and the Bantu peoples of central and south Africa. Bantu is a linguistic term, and the division between the two masses of population is primarily linguistic. But there are physical differences also. Scattered amid the big blacks of central Africa are the pygmy groups, and in the Kalihari desert region of the south live Bushmen.

**American Peoples.**—The double continent, America, was occupied solely by the American race, except along the northern coast, where Eskimo live. American Indians have never been seriously classified upon the basis of physical types, due to the uniformity already mentioned.

Language is the basis generally employed in dividing the race into study groups. There are hundreds of languages spoken among them, and even language families, or independent stocks, number scores. Powell recognized fifty-eight linguistic families in North America north of Mexico. Britton divides the double continent into five geographical regions—North Pacific, North Atlantic, Isthmian, South Pacific, South Atlantic. North Pacific, North Atlantic and Isthmian make up North America; the other two regions constitute South America.

While this division is geographical, Britton emphasizes the fact that these regions are really culture areas as well. In such an article as this further detail would but confuse by introducing a multitude of tribal names.

**Oceanic Peoples.**—The Island World is not a unit ethnologically. It includes four well-marked, clearly characterized, areas—Malaysia, Melanesia, Australasia and Polynesia.

**Australasia.**—These may be separated into the Australian and the Tasmanian types. The latter seem more primitive and approaches, perhaps, the Melanesian. The Australians are fundamentally blacks, Ethiopic, but have been influenced by Dravidian or other elements until they have lost the woolly hair. With chocolate brown skin, broad nose, dolichocephaly, and medium stature, they present a fairly uniform type, which some authors class among the great races.

**Melanesia** includes New Guinea or Papua and a number of groups of smaller islands. The true Papuan shows a fairly distinct

type, but he is usually included with the rest under the general term *Melanesian*, which includes all the large Oceanic negroes, Ethiopic in race.

**Malaysia** extends from Madagascar to Melanesia, thus lying west of the two areas just considered. It includes the great islands of Sumatra, Java and Borneo; also Celebes, the Philippines, and many smaller islands; Formosa, ethnically, is Malayan. Malays form the chief population, but Melanesians have had local influence, and negroes, little blacks, occur at many points.

The most interesting portion of Malaysia is the Philippine archipelago. Its ethnology is complicated. After making the first serious study of it, Blumentritt suggested the following theoretical explanation: Four populations occur—

(1) the aboriginal Negritos; (2) a great list of tribes representing an early Malayan immigration, tribes like the Igorot, Iugos, etc.; (3) a second Malayan immigration of people much further advanced in culture, represented by the civilized "Cristiano" populations, which form the bulk of the Philippine peoples to-day, Tagals, Visayans, Ilocano, etc.; (4) a third Malayan immigration, Mohammedans, the "Moros" of Mindanao and the Sulu islands. This immigration was just well under way when the Spaniards appeared in the sixteenth century and checked it. It seems to have been a northward streaming of Malaysians from the Philippines and Formosa that carried Malay blood and influence into Japan. The Japanese are not pure Mongols, but owe much to Malays.

**Polynesia** is singularly uniform in population. There are local mixtures, of course, where the area touches Melanesia.

The recent streaming out of white men into all parts of the world has had a remarkable influence on race vitality and characteristics. To-day in America and Australia, in Polynesia, and even in Africa, the original populations are disappearing or subordinated.

**OUTLINES OF GEOLOGY.**—Geology is the science which treats of the development of the earth.

**Departments or Phases.**—Astronomic or Cosmic Geology treats of the influence that the sun, moon, and other heavenly bodies have upon the earth.

**Chemical Geology** is that branch of dynamic geology in which are discussed the chemical and chemical processes active in the creation or modification of earth conditions. **Crystallography** is that branch of mineralogy

which is concerned with the investigation and recognition of the regular geometrical forms that many minerals assume when free to do so at the time of their formation.

**Dynamic or Philosophic Geology** is a discussion of the agencies and forces involved in the development of the earth.

**Economic Geology** is that branch of geology which treats of the occurrence, the distribution, and the laws governing the formation of the economically important earth constituents.

**Geognosy** is a study of the form and constituents of the earth, and of the structure or arrangement of the earth's components.

**Geotectonic or Structural Geology** is that branch of geognosy in which the structural arrangement of the constituents of the earth is discussed.

**Glacial Geology** is that branch of physiography which treats of the modifications of the earth's surface produced by masses of ice.

**Historical Geology** is a presentation of the sequence of events in the history of the earth and its inhabitants.

**Lithology** is that branch of geognosy which is concerned with the study of rocks without the aid of the compound microscope.

**Mineralogy** is that branch of geognosy which treats of the nature, appearance, occurrence, and value of minerals.

**Mining Geology** is that branch of geognosy in which are discussed the principles applicable to the solution of mining problems.

**Paleontology** is that branch of historical geology which deals with extinct or fossil fauna (animals) and flora (plants).

**Petrology** is that branch of geognosy which is concerned with the study of thin sections of rocks by means of the compound microscope.

**Physiography, or Physical Geography,** is that branch of dynamic geology which treats of the surface configuration of the earth, the forces which modify this, and the changes which thus result.

**Stratigraphical Geology** is that branch of geognosy in which stratification and the features found in, or connected with, stratified rocks are discussed.

**Geological Agencies or Forces.**—All features of the external form and accessible internal structure of the earth are due to the action of either air, water, or heat produced by pressure or chemical activity, and these are known, respectively, as the atmospheric, aqueous, and igneous geological agencies. These three great agencies have been active throughout geological time, their effects in past ages being essentially similar to those they now produce.

#### THE ATMOSPHERE AS A GEOLOGICAL AGENT

The work and functions of the atmosphere are suggested by the following outline:

I. Acts as a protective thermal blanket for the earth.

II. Sustains life.

III. **Chemical work.** Through evaporation, precipitates substances from solution in water. Oxidizes surface materials. Tends to disintegrate surface materials. Forms carbonates from surface materials. Tends to disintegrate surface materials. Forms hydrates from surface materials. Forms soils. Usual vapors and gases, often the products of volcanic activity, attack and change the nature of surface materials.

IV. **Mechanical work.** Wind removes loose surface material. Wind generates water waves and currents. Wind uproots trees and thus breaks up the soil. Wind transports seeds and small organisms. Wind transports and deposits sand as dunes. Wind transports and deposits fine material as loess. Wind aids in holding dust in suspension in the atmosphere, thus affecting the temperature and aiding condensation.

V. **Thermal work.** Changing temperatures tend to rupture rocks as a result of sudden contraction and expansion. Freezing of water in cracks involves expansion and tends to rupture rocks. Form soils.

VI. **Electrical work.**

Rocks may be ruptured by lightning, thus hastening their disintegration and aiding the formation of soils. Rocks may be fused by lightning and their mechanical or chemical disintegration be thus retarded.

VII. Is a medium for the evaporation and precipitation of water, forming clouds, fog, rain, snow, hail, and cloudbursts.

#### WATER AS A GEOLOGICAL AGENT

The work of water, outside of its influence upon the condition of the atmosphere, may be thus outlined:

I. **Moving surface water.** Erosion. Cuts all types of valleys and tends to remove, ultimately, all hills and mountains, thus reducing the inequalities on the earth's surface. Transportation. Eroded fragments are carried great or small distances, depending upon their size and the velocity of the current. Deposition. Flood-plain deposits and deltas of rivers are formed when a decrease in the velocity of the current causes the deposition of transported fragments, which are usually well rounded.

II. **Chemical work.** Solution. Dissolves soluble portions of rocks.

## WATER AS A GEOLOGICAL AGENT—Continued

	<p><b>EROSION.</b> Waves and currents cut into shores and tend to enlarge the area of lakes and seas.</p> <p><b>TRANSPORTATION.</b> Fragments derived from erosion by waves and currents are carried in suspension by currents.</p> <p><b>DEPOSITION.</b> Transported fragments are deposited, mostly near shore, forming sedimentary or stratified deposits.</p>	
<b>Mechanical work.</b>		
<b>II. Standing water.</b>		
<b>Chemical work.</b>	<p><b>SOLUTION.</b> Soluble portions of shore are dissolved.</p> <p><b>PRECIPITATION.</b> Soluble substances derived from tributary streams or the shore are deposited by evaporation or by the infolding of one on another, forming deposits of rock-salt, gypsum, limestone, borax, alkaline carbonates, etc.</p>	
<b>Mechanical work.</b>	<p><b>ENCLOSURE.</b> Unimportant, but may form caves.</p> <p><b>TRANSPORTATION.</b> Relatively unimportant.</p> <p><b>DEPOSITION.</b> Relatively unimportant.</p>	
<b>III. Underground water.</b>		
<b>Chemical work.</b>	<p><b>SOLUTION.</b> Soluble materials with which the water comes in contact are dissolved, forming caves, particularly in limestone, and making "mineral water."</p> <p><b>PRECIPITATION.</b> Substances in solution are deposited due to relief of pressure, lowering of temperature, or chemical interaction, forming mineral veins and spring deposits, partially or wholly filling cavities encountered, or acting as a cement for loose earth material.</p>	

## IV. Ice Mechanical work.

**KNOWNS.** Alpine or valley glaciers partially shape amphitheatres or cirques, where snow accumulates and melts into ice. They also form U-shaped valleys leading down-ward therefrom, and "bedded rock fragments grooved or glaciated" (the bedrock beneath).

Great continental glaciers strip off the mantle of softened, altered weathered soil, as well as some of the solid rock below, which is also grooved or glaciated by "striated rock fragments."

**TRANSPORTATION.** Material that falls upon a glacier is carried on the surface, either in the middle (medial moraine) or lateral (lateral moraine) or near its way down into the ice and forms a part of the englacial drift, while that eroded beneath the glacier is dragged along in the bottom of the ice or between the glacier and the solid rock below (ground moraine).

All the material transported by a glacier is apt to be unaltered, rather angular, although the edges of the fragments that form the ground moraine may be somewhat rounded, and they may be glaciated on one or more faces.

**DEPOSITION.** The melting of a glacier causes the deposition of the material in or on the ice, that which accumulates at the end forming a terminal moraine, while that along the sides forms lateral moraines. Medial moraines are apt to be washed away by the melting ice.

Beneath continental glaciers, the ground moraine is often heaped into low, smoothly rounded hills called drummings, while, over the subglacial streams, flowing in cracks in, or tunnels beneath, the ice, deposit long, winding, steep-sided ridges called eskers. The rounded hills or hummocks in terminal moraines are called eskers.

## HEAT AS A GEOLOGICAL AGENT

The internal heat of the earth is conducted slowly outward to the surface through the cool outward portion, and is also carried rapidly upward through the medium of ascending molten material. The effects of such transference of heat from one position to another may be thus outlined:

- I. Effects of the gradual outward conduction of heat, and consequent differential expansion and contraction of different portions of the so-called "crust."
  - a. Formation of mountains accompanied by folding of the materials involved.
  - b. Changes in the character (metamorphism) of the earth materials involved in such movements.
  - c. Production of cracks or fissures with or without the slipping of one side relative to the other.
  - d. Occurrence of earthquakes as a result of such fracturing or slipping.
- II. Effects of ascending molten material, and the consequent differential expansion and contraction of different portions of the crust.
  - a and b. Same as e and d above.

**MINERALOGY.**—The science which treats of the properties of mineral substances, and teaches us to characterize, distinguish, and class them according to their properties. Geology, or geognosy, was formerly included in the science of mineralogy, but this term has more recently become restricted to the study of the individual minerals, their aggregation into rocks and their relations to each other forming an important section of the science of geology.

The science of mineralogy, however, is not confined to the study of the external characters of mineral substances, their chemical composition being equally important.

**Classification.**—Minerals may be described and classified either in accordance with their chemical composition, their crystallographic forms, or their physical properties of hardness, fracture, color, luster, etc., or a combination of all, and thus various systems of classification have been adopted. Most minerals crystallize in definite forms, and this form is one of the chief characteristics of many mineral species. There are not a few, however, which are not distinctly crystalline, but are earthy or occur in masses; the latter exhibiting important varieties of structure, as laminated, fibrous, granular, reniform, botryoidal, etc. Other distinctive characteristics are color, which, however, varies even in the same mineral; luster, the character of the light reflected from the surface, and described as adamantine, vitreous, nacreous, greasy, silky, etc.; fracture, or the character of the freshly-broken surface; streak, or the appearance and color of a furrow made in the mineral by a hard-tempered knife or file; and hardness, which is now determined by what is called Mohs' scale.

In this scale certain minerals are represented by numbers from 1 to 10, viz.—

- (1) *Talc*, common laminated light-green variety.
- (2) *Gypsum*, a crystallized variety; (2.5) mica.
- (3) *Calcite*, transparent variety.
- (4) *Fluor spar*, crystalline variety.
- (5) *Apatite*, transparent variety. (5.5) *scapolite*, crystalline variety.
- (6) *Potash feldspar*, white cleavable variety.
- (7) *Quartz*, transparent.
- (8) *Topaz*, transparent.
- (9) *Corundum*.
- (10) *Diamond*.

To determine the hardness of a mineral, it is ascertained by experiment which of these it will scratch and which will scratch it; thus if a mineral will scratch fluor spar but not apatite, while the latter will scratch it, its hardness is between 4 and 5. Diaphaneity, refraction, polarization, electric properties, etc., are all distinguishing marks.

**Precious Stones.**—Are those which, because of their beauty, hardness, and rarity, are prized for use in ornamentation, especially in jewelry. The diamond, ruby, sapphire, and emerald are the only stones which are, strictly speaking, entitled to be called "precious" in this sense; but the opal, on account of its beauty, is often classed with the precious stones; as is also the pearl, which is really not a stone, but a secretion of a shellfish.

**Agate.**—A semiprecious, uncrystallized variety of quartz, in various tints in the same specimen. Its colors are delicately arranged in stripes or bands, or blended in clouds.

**Almandine.**—A variety of chrysoberyl found in the mica slate of the Ural mountains. It is of a rich garnet color by artificial light, by daylight of a dark moss green. It is the only stone that so

changes. The finest specimens of alexandrite are rare and valuable as diamonds.

**Almandine.**—A common maroon-red variety of garnet.

**Ametyst.**—A variety of crystallized quartz, of a purple or bluish-violet color, of different shades. It is much used as a jeweler's stone. The lighter colored ones come from Brazil, the deep purple ones from Siberia. In value they are about the same as the garnet.

**Aquamarine.**—A transparent, sea-green variety of beryl, used as a gem.

**Axehurine.**—A variety of translucent quartz speckled throughout with scales of yellow mica.

**Beryl.**—A very hard mineral of much beauty when transparent. It occurs in hexagonal prisms, commonly of a green or bluish-green color, but also yellow, pink, and white. It is a silicate of aluminum and beryllium. Beryl is very rich in colors. Their value is about four dollars per carat.

**Carne.**—A figure cut in stone or shell that is composed of different colored layers. The value depends on the artistic merit of the engraved figure.

**Chalcodony.**—A green siliceous stone sprinkled with red Jasper, whence the name.

**Chrysoberyl.**—A beautiful gem of a deep red color (with a mixture of scarlet), found in the East Indies. When held up to the sun it loses its deep tinge, and becomes of the color of a burning coal. The carbuncle of the ancients is believed to have been a garnet. The name is now given also to the ruby, sapphire, and the red spinel. The oldest and most valuable is a garnet cut as carbuncle, and is worth about one dollar a carat.

**Chrysoberyl.**—A variety of chrysoberyl, of a clear, deep red, flesh-red, or reddish-white color. It is moderately hard, capable of a good polish, and often used for seal stones.

**Carbuncle.**—A variety of quartz or chalcodony exhibiting opalescent reflections from within, like the eye of a cat. The name is given to other gems affording similar effects, especially the chrysoberyl.

A fine specimen about three-eighths of an inch across would be worth from two to three hundred dollars.

**Chalcodony.**—A cryptocrystalline, translucent variety of quartz, having usually a whitish color, and a luster somewhat like that of the opal.

**Chrysolite.**—A mineral, composed of silica, magnesia, and iron, of a yellow to green color. It is little used.

**Chrysoberyl.**—An apple-green variety of chalcodony. Its color is due to nickel contained in its composition.

**Dendrite.**—A stone or mineral in which are branching figures, resembling shrub or tree, produced by a siliceous mineral, usually by an oxide of manganese, as in the most agreeable.

**Diamond.**—A precious stone or gem encasing in brilliancy and transparency, and remarkable for extreme hardness. It is found in many hues—green, rose, straw, yellow, etc., but the straw-colored ones are the most common. The diamond is a native carbon occurring in isometric crystals, often octahedrons, with beveled edges. It is the hardest substance known. Diamonds are said to be of the first water when very transparent, and of the second and third water when the transparency decreases.

**Depend.**—A crystallized variety of pyroxene (a silicate of lime and magnesia), of a clear, grayish-green color, also called *maurand*. It is the most valuable variety of a rich green color; it is the most valuable variety of a rich green color; it is the most valuable variety of a rich green color.

**Emerald.**—A mineral, commonly of a yellowish-green color, occurring granular, massive, columnar, and in crystals. It is a silicate of alumina, lime, and oxide of iron, or manganese.

**Esmeralda.**—Cinnamon stone. A variety of garnet. It is not much used.

**Fluorite.**—Calcium fluoride, a mineral of many different colors, white, yellow, purple, red, etc., often very beautiful. When crystallized it is commonly in cubes with perfect octahedral cleavage. Some varieties are used for ornamental purposes, and others for glass, *fluor spar*, or simply *fluor*. The colored varieties are often called *fluor ruby*, *fluor emerald*, *fluor sapphire*, and *fluor topaz*.

**Fine.**—A mineral, somewhat like the variety of quartz, of a color usually of a gray to brown or nearly black, breaking with a conchoidal fracture into small, sharp edges.

**Flour spar.**—Same as fluorite.

**Garnet.**—A mineral having many varieties, differing in color and in chemical composition, but with the same general chemical formula. The commonest color is red; the luster is vitreous, or glassy; and the cleavage is greater than that of quartz, about half as hard as the diamond.

The common crystal forms are the dodecahedron and the trapezohedron. Besides these, however, there are also white, green, yellow, brown, and black ones.

The garnet is a silicate with various bases, such as alumina-lime (granularite compound or cinnamon stone), alumina-magnesia (pyrope), alumina-silica (spessartite), and chromium-lime (cymophane, or emerald-green). The transparent red varieties are used as gems. The garnet was first discovered in the granite of the Cornish hills, a very common mineral in granite and mica slate.

The finest specimens of red garnets come from Ararat, and a single carat stone is worth from two to four dollars. A green variety that comes from Russia is worth about half as much as the diamond.

**Gibbsite.**—Same as beryl.

**Hyalite.**—A green siliceous stone sprinkled with Jasper, as if with blood, whence the name.

**Imperial.**—An important one of iron, the sequoia, so called because of its red color when in the form of powder. It occurs in splendid rhombohedral crystals, and in massive and earthy forms, the last being called red ochre. It is now seldom used in jewelry.

**Jacinth.**—A red variety of silicon, sometimes used as a gem. It resembles closely a dark Spanish topaz, and is worth a little more than the garnet.

**Jasper.**—A mineral occurring in tetragonal crystals and also massive, of a brown to green color, rarely yellow or blue. It is a silicate of iron, lime, and lime, with some iron and magnesia. It is common at Mt. Vesuvius. It is little used.

**Jaspe.**—A variety of tourmaline of an indigo-blue color.

**Jaspe.**—A silicate of alumina, iron, and magnesia, having a bright blue color and a vitreous or glassy luster. It is remarkable for its dichroism, and is called *chalcid*.

**Jaspe.**—Same as jacinth.

**Jaspe.**—A stone commonly of a pale to dark green color, but sometimes whitish, as if with a very tough, capable of a fine polish, and is used for ornamental purposes and for implements, especially in some countries and among many primitive people.

**Jaspe.**—An opaque, impure variety of quartz, of various colors, and other dull colors, breaking with a smooth surface. (See quartz).

**Jaspe.**—A mineral occurring in thin-bladed crystals, of a crystalline structure, and is a silicate of aluminum. It is little used as a gem.

**Jaspe.**—A kind of feldspar, commonly showing a beautiful play of bluish-gray colors, and, hence, much used for ornamental purposes. The finest specimens come from Labrador.

**Jaspe-larv.**—A mineral of a fine azure-blue color, usually occurring in small rounded masses. It is essentially a silicate of iron, iron, and soda, with some sodium sulphide. It is often marked by yellow spots or veins of sulphide of iron, and is much valued for its color.

**Jaspe.**—A nearly pellucid variety of feldspar, showing poorly or opaline reflections from within.

The best specimens come from Ceylon. Their value is not much more than the expense of cutting.

**Jaspe.**—A hard, compact mass, of a dark green color, formerly used as remedy for diseases of the kidneys, whence its name *kidney stone*.

**Jaspe.**—A kind of stone, of a reddish-yellow color. It is usually of a black color and opaque, except in thin splinters.

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**Uranian emerald.**—A precious stone of a rich green color, a variety of beryl.

**Verd antique.**—A mottled-green, serpentine marble. Also a green porphyry, which is called *verd antique*.

**Zircon.**—A mineral occurring in tetragonal crystals, usually of a brown or gray color. It consists of silicon and zirconium, and is harder than the garnet. The transparent varieties are used as gems. The red variety is called *Hyacinth*; a colorless, pale yellow, or smoky-brown variety from Ceylon is called *Hyacinth*.

**ORNITHOLOGY.**—The science which teaches the natural history and arrangement of birds; or, to use the definition of Cuvier, of vertebrate oviparous animals, with a double circulation and respiration, organized for flight.

**Classification.**—Many systems for the classification of birds have been proposed. A common division is into seven orders, to which an eighth, the *Saururæ* of Huxley, is often added, to include the extinct archopteryx. These orders are:

**Order I.—Raptors or Accipitres.** Birds of prey, as eagles, vultures, hawks, and owls. Beak strong and curved, sharp hooked, and adapted for seizing and destroying other animals. Claws sharp, much hooked, and retractile. Hind toe on the same level with the others. Wings well developed.

**Order II.—Insectores, Passeres, or perching birds,** by far the most numerous order. It includes all the singing birds, and indeed, excluding the birds of prey, most birds which live habitually among trees. Feet formed for grasping and perching, claws moderately curved and not retractile. Hind toe on the same level as the rest. This order is usually divided into four tribes or suborders—*Conirostræ* (conebilled); *Dentirostræ* (tooth-billed); *Tenirostræ* (slender-billed); *Fistirostræ* (clef-billed).

**Order III.—Scoliopteres or Zypodactylæ.** Climbing birds, as the parrots, wood-peckers, cuckoos, toucans, etc. Feet formed for climbing, two of the toes directed forward and two backward; powers of flight not in general great; bill variously shaped.

**Order IV.—Rasores or Gallinæ.** Domestic fowls, pheasants, pigeons, etc. Legs large and strong. Feet with the hind toe situated above the heel, suited for scratching. Bill short, thick, and arched above.

**Order V.—Cursores or Struthionidæ.** Running birds, as the ostrich, emu, cassowary, etc. Wings rudimentary and quite useless for flight; legs long and strong; hind toe wanting or merely rudimentary; breastbone without a ridge or keel.

**Order VI.—Grallatoræ or Grallæ.** Waders, as the cranes, herons, snipes, sandpipers, etc. Legs long, bare of feathers from above the knee; toes often half-webbed. Bill in general long and slender.

**Order VII.—Natatores or Palmipedes.** Swimmers; web-footed birds, as ducks, geese, gulls, etc. Feet formed for swimming, in general webbed, that is, the toes connected by a membrane. Hind toe elevated above the plane of the others. Bill various, mostly flattened. (See Dictionary of Animals).

**HUMAN PHYSIOLOGY.**—Physiology in relation to the human body, the science which concerns itself with the functions of the various parts and the manner in which they perform their duties. The work done by any part depends primarily upon the character of the minute particles of matter of which it is formed.

**Cells.**—Each of these microscopic particles is called a *cell*. It consists of a thin skin enveloping a clear substance, the *protoplasma*.

*plasm*, which contains a less granular portion known as the nucleus.

**Tissues, Organs, Systems.**—A combination of similar cells forms a *tissue*, and the union of two or more tissues to constitute a structure for the performance of a special function is called an *organ*. The heart is an organ for pumping blood and the stomach is an organ for helping to digest food. Several organs working in harmony for the accomplishment of a common purpose constitute a *system*.

**Locomotion.**—The *osseous system*, composed of over 200 bones, and the *muscular system*, formed of over 500 muscles, serve chiefly for the purpose of locomotion. One kind of muscles known as the *involuntary* are present in nearly all tubelike structures, such as the alimentary canal and blood vessels. The marked power of contraction and relaxation possessed by all muscles enables them to render important service to the bodily welfare. They have, however, no power in themselves to act, but must be stimulated by another set of organs composing what is known as the nervous system.

**The Nervous System**, consisting of the brain and spinal cord, with their thousands of tiny nerve fibers branching to all parts of the body, controls every movement and the activity of each organ. The numerous nerve fibers, which are bound into bundles forming the white cord-like nerves, are the processes of cells located in the brain or spinal cord or near to them.

**Neurone.**—A nerve cell, with its two or more processes, varying from less than a half inch to more than three feet in length, is called a *neurone*. The purpose of the processes is to transmit a stimulus or message, while the function of the body-part of the neurone is to originate a stimulus or modify one sent to it by another neurone.

**Brain.**—The neurones in the thinking regions of the brain, *i. e.*, the frontal third and the portion adjacent to the crown, seem able to originate stimuli and direct at will the daily activities in which we engage. A band of neurones in front of the central fissure of the brain is called the *motor area* because these cells control the voluntary movements of the body. The bursting of a blood vessel in this area or along the processes of these cells extending down through the brain and cord often causes paralysis of the muscles which the neurones affected govern. The band of neurones behind the central fissure form the *sensory area* of the brain. Here the impulses aroused by touch, heat, cold and pain are received. The *hearing neurones* are located in the region of the brain adjacent to the ear and those concerned in *seeing* lie in the back part of the brain.

**Communication of Neurones.**—The neurones whose cell bodies form the gray matter, and their processes, the white fibrous portions of the brain and cord, are able to communicate with one another by contact of processes. The independent neurones of the brain direct the dependent neurones both in the brain and in the spinal cord.

**Reflex Action.**—The dependent neurones can also be made to act by an outside stimulus, such as touch or pain. A pin-prick on the toe of a sound sleeper will send an impulse up the sensory nerves to the spinal cord, where it will arouse the motor neurones to send an impulse causing the muscles to contract and withdraw the limb, but the brain will know nothing of

the operation. Such activities, carried on without the effort of brain neurones controlled by the will, are known as *reflex actions*.

**Sympathetic System.**—Many neurones concerned in reflex action are located at the base of the brain and in its stem, while others of the same character form the *sympathetic system*, whose nerves supply the viscera and other organs and all the involuntary muscles of the body. The work of the lungs, heart, stomach, liver and other vital organs goes on involuntarily because the neurones governing them are stimulated to act by the needs of the body.

The taste of food stimulates the neurones, causing the stomach to form gastric juice, but we can also make the stomach do this work to some extent by thinking of the delicious flavor of foods. In this case the neurones of the brain originate a stimulus and send it down to the neurones exciting the juice-making organs to work. Even though food is in the stomach and its presence has started the flow of gastric juice, the output may in a few minutes be greatly decreased by the inhibiting influence of the neurones of the brain, aroused to action by some excitement or great grief affecting the mind.

**Influence of Mind on Body.**—Although the exact relation of the mind to the brain and other parts of the body is not entirely understood, observations and experiments show that the mind may influence the work of all the organs of the body. This fact forms a vital part of the Christian Science faith, which teaches that thought is more efficient than drugs and hygienic measures in curing disease. In many disorders of the nervous system mental suggestion renders worthy service.

**Sense Organs.**—In order that the brain may be informed of the conditions in the external world, many of the nerve fibers called sensory nerves have special terminations on or near the surface of the body called *sense organs*. The eyes are the special sense organs which are so affected by the waves of light coming from objects that they can send to the brain through their nerves a message telling how things look. The ears receive and transmit to the brain only those impulses aroused by the waves of sound. The delicate nerve endings within the nose inform the brain concerning odors, while the peculiar nerve terminations in the tongue and other parts of the mouth receive and send to the brain all knowledge as to how foods taste. Special tiny organs at the ends of nerves are scattered throughout the skin to receive the stimuli aroused by touch, heat or cold, and inform the brain when the body is being hurt.

**Foods.**—While thought and action are the chief purposes of the body, the systems which effect these must be hourly repaired and nourished, the waste matter must be gotten rid of, and a means of reproducing the species must be provided.

The chief part of the living tissues consists of *proteids* whose worn-out parts can be replaced only by the consumption of other *proteids* found in the albumen of lean meat, the white of egg, casein of milk, and in peas, beans, corn and wheat.

**Oxidation.**—Starches, sugars and fats cannot repair the worn-out parts of the cells, but by the living action of the body these foods can be made to unite with oxygen. This *oxidation* may furnish heat to keep the body warm and may also supply the energy necessary for its activities. While

the fat of the body is largely made from the starches and sugars forming what is known as the carbohydrate foods, *proteids* can also be transformed into fat and used to furnish energy and heat.

**Diet.**—The daily food requirements of a man at ordinary labor are about three ounces of proteids and one pound of starches, sugars and fats. Some inorganic salts and water are also necessary.

**Digestion.**—In order that the nourishing materials may reach all cells of the body they must be prepared to enter the blood stream for transportation. This preparation is accomplished by a group of organs forming the digestive system. The two chief processes of digestion are mastication, or the breaking up of the food into small particles in the mouth, and the transforming action of the juices from certain organs called *glands*. The important elements in the watery secretions of these glands are known as *enzymes*. These are ferments which cause chemical changes in the food without any change in themselves.

The *ptyalin* from the salivary glands of the mouth changes starch to sugar, the *pepsin* from the thousands of gastric glands in the lining of the stomach transforms part of the proteids into peptones, while the other part is acted on by the *trypsin* of the pancreas. This chief gland of digestion also yields *lipase* to split up the fats and *amylase* to make sugars of the remaining starches.

**Absorption of Food.**—After the food has been acted on by the gastric juice from one to four hours, and by the intestinal and pancreatic juices a variable period, it is in a state capable of being absorbed by the cells forming the lining of the small intestine. The absorbing surface is greatly increased by the thousands of folds and millions of tiny projections called *villi*. Within these are thin-walled tubes to receive the liquid food and pass it on to the larger blood tubes, whence it is transported to all parts of the body.

**Liver.**—The liver serves as a storehouse for part of the food, which it deals out according to the needs of the body. Much of the food passes through the liver before it is distributed to the body, thus giving this organ opportunity to remove poisons which may be present and dispose of them in the bile sent into the intestine to aid digestion.

**Circulatory System.**—The circulatory system in addition to distributing the food throughout the body, conveys the oxygen from the lungs to all the tissues and transports the waste matter from all cells to the lungs, skin and kidneys for elimination. The *plasma*, or clear part of the blood, bears the food elements, while the red corpuscles, with a special affinity for oxygen on account of their hemoglobin, load up with this gas in the lungs and discharge it to the tissues throughout the body.

**Heart, and Course of the Blood.**—The blood stream is kept in perpetual motion by the beating of the heart, with valves so arranged as to prevent any backward flow. The blood is carried by the veins from all parts of the body to the right auricle of the heart, whence it passes to the right ventricle. This sends it through the pulmonary artery to the lungs, where the carbon dioxide is exchanged for oxygen through the tiny, thin-walled capillary branches of the artery. The oxygenated blood, from the lungs, by the pulmonary vein to the left auricle, passes to the left ventricle and thence out through the aorta,

branching again and again in all regions of the body until the final subdivisions are smaller than hairs and with walls so thin that the oxygen and food can easily pass through to nourish the cells. At the same time the carbon dioxide and part of the other waste products enter the blood stream of these tiny vessels called *capillaries*, which unite to form the veins carrying the blood to the heart.

**Lymphatics.**—Some of the blood plasma and the white corpuscles passing out of the capillaries, together with some of the waste matter, enter a set of vessels called *lymphatics*. These unite into larger vessels which ramify through firm bunches of tissues called *lymph glands* and terminate in veins in the neck.

Exercise renders the lymph system more active because the muscular contractions press the waste matter into the vessels and move it forward, as a series of valves prevents the backward flow. *Massage* accomplishes the same effect and therefore like exercise greatly aids the body in removing its waste. The purpose of the lymph glands, so abundant in the groin, the armpits, the neck and amid the intestines, is to catch and destroy any infection such as bacteria.

**Respiratory System.**—The sole purpose of the respiratory system, consisting of the lungs and the air passages leading to them, is to supply the body with oxygen and cast out the carbon dioxide constantly resulting from the living processes. The inspired air consists of four-fifths parts of nitrogen, one-fifth part of oxygen and only four-ten-thousandths part of carbon dioxide, while the expired air contains one-twentieth part of carbon dioxide and less than one-sixth part of oxygen.

**Excretory System.**—The dying tissues and a remnant of the oxidized food proteins form the nitrogenous waste which is removed from the body by the excretory system. This consists chiefly of the kidneys, with the two tubes called ureters carrying the urine drop by drop into the bladder, where it is stored and passed out at intervals through a small tube called the urethra. About one and a half quarts of urine, containing some salts and an ounce of urea, the tissue waste, are excreted daily.

**Diabetes and Bright's Disease.**—In persons with diabetes the urine contains sugar because too much sugar is free in the blood. This condition may be due to a disorder of the cells of the pancreas or liver. In Bright's disease the cells of the kidney fail to perform their work and allow some of the nourishing part of the blood to escape with the urine. Such a condition is sometimes due to a prolonged fever, the excessive use of alcohol, a heavy meat diet, lack of thorough mastication or too little exercise.

**Skin.**—The skin is also an organ of excretion, as its millions of sweat glands pour out daily from one quart to a gallon of perspiration containing some salt and a little urea. The chief use of the sweat, however, is to cool the body. The skin is filled with the terminations of the nerves of sense, whose stimulation by heat or cold excites to action the entire system.

**Bathing.**—On this point depends the physiologic effects of bathing and hydrotherapy. Many internal chronic disorders, as well as acute ailments, are frequently alleviated or entirely cured by the proper application of water when all other measures fail. Since a large portion of the blood passes through the skin each minute,

cold bathing relieves the body of much heat and is therefore the most efficient means of lowering the temperature in cases of fever.

**Hair.**—Each hair grows from a little papilla at the bottom of its sac and will be renewed every time it is pulled out so long as the papilla is uninjured. A pair of sebaceous glands in connection with each hair furnish an oily substance to soften the hair and skin. The loss of the hair on the scalp is seldom due to any microbe or germ, but to a diminishing of the nourishment from the blood-vessels in the papilla. The best remedy for falling hair is a thorough washing of the scalp fortnightly and a daily five-minute massage continued for several months.

**Reproductive System.**—The average length of life of each individual is about 45 years. To continue the race new individuals must arise. The only portion of the body, however, which can give origin to a new being is a special large cell called an *ovum* or *egg* developed in females from about the thirteenth to the fifteenth year within one of two small organs called the ovaries lying below the kidneys. This special cell or ovum is capable of further growth only after another special cell, the *spermatozoon*, from the testes of the male has united with it. After the union of the two cells, which process is known as *fertilization*, the egg continues down the tube leading from the ovary into a thick-walled sac, the *uterus* or *womb*. Here it becomes fixed to the soft lining, absorbs nourishment from the blood of the mother for a period of about nine months, when it is born as a complete individual.

**HYGIENE.**—Hygiene is the science which concerns itself with the prevention of disease and the maintenance of the body in vigorous health. Personal hygiene relates to the special care of one's own body, while public hygiene includes much of sanitary science and deals with the general food supply, water supply, disposal of sewage, quarantine regulations and other questions affecting the entire community.

**Death Rate.**—The development of the science of hygiene began about the middle of the nineteenth century and has made such rapid progress as to greatly lessen the death rate in communities regulating their living according to its teachings. In benighted India the death rate is 42, i. e., 42 people die annually among every thousand living. In the United States the death rate is 17, while in Norway, Denmark and Sweden, where hygienic living is practiced by the greatest numbers, the death rate is only 14 per thousand.

**Length of Life.**—The average length of life increases with our growing knowledge and practice of healthful living. The average length of life in the sixteenth century was about 18 years; to-day it is over 40 years in Germany, England and the United States. The life span in France in 1830 was only 39 years, while in 1900 it was over 47 years. In Massachusetts it increased from 39 years in 1850 to 46 years in 1900.

**Cause of Sickness.**—There are about 3,000,000 people sick every day in the United States and one-half this number die annually from disease. Recent investigations show that at least one-fourth of this sickness and death can be avoided by the individual and combined efforts of the people of our country. Much of the sickness and about one-half of the deaths result from diseases caused by the

countless army of unseen life called *microbes*.

**Contagious Diseases.**—Microbes are the agents concerned in all *infectious diseases*, some of which are spoken of as *contagious* because the healthy readily contract the ailments by associating with the sick or by handling articles from the sickroom. The germs of tuberculosis slay 150,000 persons yearly in the United States, pneumonia destroys more than 100,000 lives, while typhoid fever kills about one-tenth of its 250,000 victims. Over 100,000 infants perish yearly from digestive disorders due to bacteria, largely introduced by unclean milk and other food.

**How Disease Germs Are Scattered.**—The germs of typhoid fever, cholera, dysentery and diarrhoea leave the body in the excreta from the bowels and kidneys. The body of a sick person is a germ garden yielding a deadly harvest of microbes which if allowed to escape alive in the body waste are quite certain by the aid of wind, water or insects to find new victims. This fact shows the vital importance of treating the body excretions in such a manner as to destroy the agents of disease. If this were carefully done for even a decade, students of hygiene believe that tuberculosis and typhoid fever would be lessened by one-half.

**How Typhoid Is Contracted.**—The germs of typhoid generally reach new victims either in water or in food, though they may be transferred to the mouth by the fingers or other objects which have been in contact with the sick. Fortunately the germs will generally not live in ordinary river water more than ten days and most of them are destroyed by sedimentation, sunlight and other agencies during twenty-four hours transportation in a stream averaging two or three feet in depth and flowing at the rate of about three miles an hour. Investigations indicate that more than one-half of the cases of typhoid fever are due to contaminated water.

**Food as a Source of Infection.**—Such foods as shellfish, celery and cress are sometimes the source of typhoid and dysentery when they have been taken from water or earth contaminated by sewage or night soils.

Since tuberculosis is widely distributed among the cattle of this country and as many as 10 per cent are affected in many localities, market milk frequently contains tubercle bacilli. These germs enter the milk sometimes through the udder and more frequently by means of the feces which soil the cow and are then knocked as dry particles into the milk pail.

**Diarrhoea in Infants.**—The greater part of the diarrhoea and intestinal disorders of infants, resulting in over 10,000 deaths during each warm month of the year, is due to the large number of germs of various kinds in unclean milk. In many instances the milk when delivered to the customers in the city contains one million germs per cubic centimeter. Milk from healthy cows and properly cared for should not contain more than 30,000 germs per cubic centimeter when twenty-four hours old.

**Other Diseases Conveyed by Milk.**—In addition, to typhoid fever and tuberculosis, scarlet fever and diphtheria are frequently transmitted through the agency of milk. This fact explains why every one should wash his hands thoroughly before handling milk, in which diphtheria and typhoid germs multiply rapidly.



Since the year 1908 it has been clearly demonstrated that the germs of some diseases are introduced directly into the blood by insects.

**Insects Conveying Disease.**—The agents of malaria, yellow fever and filariasis are known to be transmitted by the bite of certain mosquitoes which have previously sucked blood from patients suffering from these diseases. Havana was freed from yellow fever for the first time within a century by destroying the breeding places of mosquitoes in the quiet waters. The destroying fevers which made it impossible for the French to dig the Panama canal are kept away from our laborers now accomplishing the task by driving away the *Siegmia* and *Anopheles* mosquitoes.

**Bubonic Plague, etc.**—Fleas of the rat and some other kinds transmit the germs of bubonic plague from man, rats and ground squirrels to man. The plague was stopped in California by killing the rats. The tsetse fly of Africa bears the deadly microbe of sleeping sickness from the sick to the well, and a certain tick seems to be responsible for the spread of the Rocky mountain spotted fever. The common body louse in some cases, if not always, serves as the carrier of the typhus fever from man to man. Leprosy and pellagra are probably also insect-borne diseases. Since pathogenic germs are so widely distributed and are even present occasionally in the air breathed it is impossible to prevent entirely their entrance into the system. In fact persons in health have frequently been found with germs of diphtheria or pneumonia in the mouth, and post-mortem examinations and tuberculin tests show that less than one fourth of the persons infected with the tubercular germs actually succumb to the disease. The explanation of the freedom of certain persons from some diseases is found in the fact that the body has been made immune. This condition of immunity or safety from certain maladies may be accomplished in several ways.

**Infection With Tubercle Bacilli.**—Experiments and observations show that the tubercle germs, especially in children, can pass from the alimentary canal into the blood and be carried to the lungs, where they most frequently cause disease. Extensive studies, however, show that probably 90 per cent of the victims of the white plague have been infected by the germs in human sputum carried to food by flies or transmitted by the drinking cup, fingers, or dust.

**Prevention of Disease.**—One effective method of preventing the ill-health due to these man-eating microbes, which give off a poison called toxin while they feed on the human flesh, is to wage a warfare seeking their complete destruction. Most of the pathogenic germs, i. e., those producing disease, are developed in the bodies of the sick and are distributed in their excretions. The germs of tuberculosis, pneumonia, diphtheria, scarlet fever, whooping cough and measles are present in vast numbers in the sputum discharged from the mouth and often smeared on drinking cups, pencils, books and the fingers. These deadly bacteria may remain in the saliva several weeks or in some cases even months after the recovery of the patient.

**Disinfection.**—The process of destroying agents of disease is called *disinfection* and the substance used is a *disinfectant*. Formaline, bichloride of mercury, carbolic acid, chloride of lime, hydrogen peroxide,

boiling water and sunlight absolutely destroy disease bacteria in a few minutes, and are therefore called *germicides*. Weak solutions of carbolic acid, boric acid and lime do not kill the germs but prevent their growth, and are on this account known as *antiseptics*.

One of the best methods of disinfecting the stools of a patient with typhoid fever, dysentery or diarrhoea is to add to them an equal part of 5 per cent formaline (5 parts of 40 per cent formaldehyde solution to 95 parts of water) and allow the mixture to stand two hours before disposing of it. This destroys not only the germs but also all odor.

**Vitality of Germs.**—One of the best disinfectants known is sunlight. Germs of typhoid fever, tuberculosis and diphtheria spread out in a thin layer are destroyed by exposure to a bright sun in less than one hour, while in a dark room they may live for weeks or even months. The fact that typhoid germs buried in the soil or remaining in privy vaults may retain their virulence for more than three months explains the danger in using night soil on truck patches.

**Purifying Water.**—Because of this fact several hundred towns and cities during the last twenty years have constructed large filters for removing germs from the water before it is delivered to the users. In many cities with a previously heavy typhoid mortality the filtration of the water supply has reduced the annual number of typhoid cases one-half, and in some instances, including Albany and Pittsburgh, effective filtration has lessened the typhoid morbidity three-fourths.

Contaminated water may also be made safe for drinking by heating it until the boiling point is reached. Actual boiling renders it insipid. A Berkefeld or Pasteur-Chamberland filter costing only a small sum may be attached directly to the spigot in the house, so that it will keep the water free of germs provided it is cleaned and boiled weekly.

**Public Sewage Disposal.**—In order to avoid the pollution of the water supply many cities have during the last decade constructed sewage disposal plants consisting of septic tanks and fermenting beds for breaking up the solid matter and reducing it in some degree to gases and inorganic substances. This also destroys many of the pathogenic bacteria and the others may be eliminated by the use of a sand filter or treatment with chemicals.

**Private Sewage Disposal.**—The improper disposal of the waste about the house results in the spread of typhoid fever, dysentery, and hookworm disease. Where there is no water supply to carry the waste off to the septic tank and contact beds, the dry-pail closet is the most sanitary arrangement. This consists of a water-tight tub or galvanized iron can to receive the excreta, and a box of dry earth of which about a pint should be scattered over the surface of the contents of the tub or can each time it is used. This process prevents unpleasant odors and helps to rapidly mineralize the organic matter. When the receptacle is full the contents should be emptied in the garden or field remote from the water supply and covered with a little soil.

**Insects and Disease.**—A feature of great importance in the disposal of body waste is the exclusion from it of flies. These insects have caused many epidemics of typhoid fever and dysentery by distributing in milk receptacles and on food the

germs collected on their feet from the filth upon which they often feed. The wisdom of protecting all food from flies is further shown by recent investigations demonstrating that they not only infect food with the germs of tuberculosis carried on their feet from sputum, but also with those diseases eaten in their feces on sputum and later deposited as fly specks. This fact clearly shows why it should be unlawful to spit upon floors or sidewalks, or use open spittoons which contain no disinfectants.

**Preventing Hookworm Disease.**—In the Southern states, where many persons in nearly every community are infected with hookworms, the tub for the excreta should be filled one-fourth full of a 5 per cent crude carbolic acid solution to kill the eggs which pass from infected persons by the thousands daily. Instead of using a tub or can for the excreta a cement vault may be built under the privy and emptied at intervals of a few weeks far away from the water supply.

Improper care of excreta has resulted in the pollution of the water and soil about many homes. Here the typhoid germs and young hookworms wait for their victims. The worms are able to enter the body not only in water and food but also by piercing the skin and boring into the blood vessels, in which they are carried to the lungs. Here they enter the air sacs, make their way up the windpipe, and then journey down the gullet, and through the stomach to their home in the intestines.

**Preventing Tuberculosis.**—Continuous living in the pure air, deep breathing for a few minutes several times daily, the use of nutritious foods, such as eggs, milk, meat and cereals, and the avoidance of excesses of all kinds will so strengthen the tissues of the body that they will be able to destroy any tubercular germs which enter. The habit of sleeping with wide-open windows summer and winter, taking a cold bath upon rising, and devoting one hour to outdoor exercise daily will do much more not only in fortifying the body against tuberculosis but also against colds, catarrh and other minor ailments.

Cancer and diseases of the kidneys and heart are greatly on the increase, while nearly all other diseases have decreased notably during the last decade. Many of the early superficial cancerous growths may be cured by the use of the X-rays, but the surest remedy for internal cancers is removal by the surgeon.

Late studies indicate that wrong diet, immoderate and lack of exercise have considerable influence in causing morbid changes in the blood vessels and kidneys and inducing rheumatism. The consumption of starches and sugars greatly aggravate diabetes, and rheumatism and Bright's disease are made worse by a meat diet and alcohol.

**Keeping Germs Out of the Body.**—Owing to the hygienic ignorance and carelessness of a considerable part of mankind the germs of contagious diseases are being scattered by the millions daily. For this reason it is necessary to take precautions to prevent the entrance of these into our bodies. Articles used by the sick and the rooms in which they have lived often harbor the germs of disease. Eating utensils and linen may be disinfected by placing them in boiling water a few minutes. The sickroom, after the recovery or death of the patient, should be treated with formaldehyde gas. This may be generated in sufficient quantity to disinfect a room

of a thousand cubic feet by adding one pint of formaldehyde solution to a gallon of water containing twelve ounces of potassium permanganate. The room should remain tightly closed for twelve hours. Clothing, metals and furniture are in no way injured by the gas.

**Vaccination**—Specific immunity against various infectious diseases may be acquired by vaccination. This consists in inoculating the body with weakened germs or the growth-products of the same kind of germs as those causing the disease to which one wishes to become immune. Immunity from typhoid fever, plague and cholera is often secured by injecting under the skin dead cultures of the germs of these diseases. Immunity from hydrophobia is secured by several successive inoculations with hydrophobia germs which have been weakened in the spinal cords of rabbits exposed to dry air from two to fifteen days.

The most successful vaccine produced is that which prevents smallpox, the most dreaded malady of the eighteenth century, when it killed 60,000,000 people in Europe. This vaccine is prepared by weakening the smallpox germs by growing them in the skin of calves. These weakened germs when smeared on the broken skin of the arm result in the formation of a large scab, some fever and slight indisposition due to the products of the germs, which cause the body tissues to react and form substances capable of destroying the strong smallpox germs which may later reach the body. Owing to the fact that these substances so inimical to the smallpox germs in the body become successively weaker each year after four or five years, it is necessary for one to be vaccinated every ten years until middle life.

**Antitoxins**.—Immunization against such diseases as lockjaw and diphtheria is effected by introducing into the body substances which nullify the poisons generated by the growing germs. These substances are called antitoxins. They are secured from the blood of animals which have developed them to fight off the poisons of these germs injected into them at varying intervals.

The constitutional diseases, such as diabetes, rheumatism, Bright's disease, arteriosclerosis or hardening of the arteries, and certain affections of the heart, are not well understood as to their causation, and therefore efforts to prevent them have not met with success.

**The Certified Milk** to be had in many cities is usually of high quality and contains less than 30,000 bacteria per cubic centimeter. Such milk is taken from cows shown to be free of disease by periodical physical examination and tuberculin tests. The stables are kept scrupulously clean and free from flies and all the milk receptacles after being rinsed in cold water are sterilized in steam or boiling water. The milk is cooled immediately after it is drawn and stored in ice water, because warmth causes a rapid growth of the bacteria which poison the children.

**Pasteurized Milk**.—It is unsafe to give to young children milk not known to be clean and from healthy cows. When it is necessary to use questionable milk it should always be pasteurized. A special apparatus for pasteurizing may be purchased, but with some care the process may be accomplished by placing the milk in a Mason jar or tall pail, which is then set into a kettle of boiling water just removed from the stove. The water in

the kettle should stand at least as high as the milk in the pail, which must be stirred ten minutes and then left standing covered ten minutes longer. The milk should then be cooled as quickly as possible by placing it in cold water and stirring it a few minutes. Milk thus treated will usually remain sweet in an ordinary refrigerator three or four days, but it is preferable to use it within twenty-four hours.

The commercial pasteurized milk sold in many cities is often unreliable because the pasteurization has not been properly accomplished, and frequently the milk is of too dirty a quality at the beginning. Experiments prove that children thrive almost if not quite as well on properly pasteurized milk as upon clean raw milk. In pasteurization the temperature should never exceed 160 degrees and it is preferable to maintain it at about 148 degrees. Boiled or sterilized milk should not be used as the regular food for children because some of the albumin has been coagulated and salts precipitated.

**Mastication**.—Toxins injurious to the heart and other organs are commonly generated in large quantities in the large intestine of those consuming much meat. A vegetarian diet with milk, especially buttermilk, and eggs lessens the formation of these toxins and thorough mastication, often called Fletcherizing, in some way stimulates the bowels to clear the waste matter with a coat of mucus preventing the absorption of any toxins present.

The careful preservation of the teeth, the thorough mastication of a largely vegetarian diet, regular daily exercise in the open air, daily evacuation of the bowels induced by laxative foods and exercise and not by drugs, and eight hours of sleep in a room with open windows, together with a cold morning bath, are the best known means for maintaining a vigorous constitution which will have marked power in warding off both infectious and constitutional diseases, and for enabling the organs to continue in the healthy performance of their functions even beyond four score years and ten.

**PHYSICS**, or Natural Philosophy, is the science, or rather group of sciences, relating to the phenomena of the material world, or of the laws and properties of matter; more restrictedly it treats of the properties of bodies as bodies, and of the phenomena produced by the action of the various forces on matter in the mass. Its chief branches are *mechanics*, *heat*, *electricity*, *electricity* and *magnetism*.

**Electricity**.—Is the name given to the unknown cause of certain effects of very various kinds which are found to be closely connected one with another. They include two distinct kinds of attraction and repulsion—*electrostatic* and *electrodynamical*—the magnetization of iron, the deflection of magnetic needles, the production of heat and light in certain circumstances, the separation of certain chemical compounds into their constituents, and spasmodic actions on the nervous and muscular systems of animals.

The name is derived from the Greek *electron* (amber), the fact that amber when rubbed attracts light particles, such as small pieces of paper, having been known to the ancient Greeks. Friction was the only artificial source of electricity employed until Galvani, near the close of the eighteenth century, accidentally obtained it by the contact of two metals with the limbs of a frog; and Volta, developing Galvani's

discovery, invented the first galvanic or voltaic battery. Electricity produced by friction is called *frictional electricity*; that produced by chemical action on metals *voltaic electricity*.

**Conductors and Nonconductors**.—All substances which, like amber, can be made to show electrical attraction by rubbing them, are called nonconductors. Bodies which are not susceptible of excitation by friction are called conductors. They include glass, amber, sulphur, shellac, resin, silk, flannel, etc.

Electricity can be excited by the friction of a conductor against a nonconductor, and is, in fact, so excited in the ordinary electrical machine, in which glass rubs against an amalgam spread on a cushion. A metallic rod furnished with a glass handle can be electrified by rubbing it with flannel, the glass preventing the electricity from being conducted away through the hand. Substances thus electrified exhibit two opposite kinds of electricity, known respectively as *positive* and *negative*. Bodies charged with the one kind of electricity repel each other, those charged with opposite kinds attract each other. An instrument for indicating the presence of electricity is called an *electroscope*.

**Electric Conduction**.—All solid and liquid substances allow electricity to pass through them to some extent, but the differences of degree are enormous. The best conductors are the metals, especially gold, silver, and copper. Perfectly pure copper conducts about seven times as well as iron. Substances which have excessively small conducting power are not called conductors, but *insulators*, so that a good insulator is another name for an excessively bad conductor.

Among the best insulators may be mentioned glass, paraffin (the wax, not the oil), ebonite, shellac, mica, india-rubber, and gutta-percha.

The word *resistance* is used in the opposite sense to conducting power; a good insulator is said to have high resistance, and a good conductor to have low resistance.

**Electrostatics** is that branch of the general science of electricity which treats of the repulsions between like and the attractions between unlike kinds of electricity. The fundamental law of electrostatics is that if *e* and *e'* denote two quantities of electricity collected in two spaces very small in comparison with the distance between them, the mutual force which they exert upon each other is directly as the product *ee'*, and inversely as the square of the distance, if the two quantities *e* or *e'* are both positive, or both negative, the force is a repulsion; but if one is positive and the other negative, it is an attraction.

**Electric Discharge**.—The rapid escape of electricity from a charged body is an electric discharge. When the discharge takes place through a conductor it is called *continuous*, and when it takes place through a nonconductor (for example, through air) it is called a *disruptive discharge*. The name "electric discharge" is especially applied to cases in which the escaping electricity produces luminosity.

Three kinds of such discharge have been distinguished—the *spark*, the *brush*, and the *glow*. The *spark* is accompanied by a sound which varies from a faint crack to a loud bang. In nature it is seen on the largest scale in the case of lightning, which is a discharge of atmospheric electricity. The *brush* discharge is only faintly luminous. It occurs especially at sharp

points and edges of highly-charged bodies. It is barely visible by daylight, and its appearance in the dark is that of a luminous halo. It projects only a small distance into the air surrounding the body from which the charge is escaping.

The glow discharge simply renders the surface of the body luminous, and does not extend into the air at all. In some modern electric apparatus beautiful effects of electric discharge are obtained.

**Electric Currents.**—What is known as an electric current is a peculiar condition of a wire or other conductor of electricity, in virtue of which it deflects magnetic needles in its neighborhood, magnetizes a piece of soft iron around which it is coiled, has its own temperature raised, and exhibits various other effects. What is conventionally called the direction of the current is the direction in which the positive electricity may be regarded as flowing. The "strength" of a current denotes the quantity of electricity that passes through the wire in the unit of time.

Instructions for measuring the strengths of currents by chemical decomposition are called *reometers*, and instruments for measuring them by the deflection of magnetic needles are called *galvanometers*. The currents by which telegraphs are worked are usually obtained from galvanic batteries; but the far stronger currents required for other purposes are usually produced by machines called *dynamoes* driven by steam or water power. The currents in such machines are due to magneto-electric induction.

**Electro-Dynamics** is that branch of electrical science which treats of the attractions and repulsions exhibited between wires or other conductors through which currents are passing. If two wires are parallel, they will attract each other when currents are passing the same way through them both, and will repel each other when the currents are opposite. If the wires are inclined to each other at any angle, there is not only an attraction or repulsion, but a still more marked tendency to rotation, which is not satisfied till the wires have become parallel and the currents flow in the same direction through them both. When there are only two straight wires these forces are feeble and require delicate apparatus for their exhibition; but by employing coils of wire the forces are multiplied, and an instrument constructed on this principle called the *electro-dynamometer* has been much employed for the measurement of currents. The whole science of electro-dynamics is due to Ampère, who discovered its main facts and reduced them by ingenious experiments, combined with very abstruse reasoning, to a single mathematical formula which includes them all.

**Velocity of Electricity.**—Daily experience with the electric telegraph shows that electrical action is propagated with great rapidity. Electricity has not a definite velocity like light or sound. It is rather comparable to waves on water, which travel with very various speeds according to their length and the depth of the water. The highest speed ever observed in the transmission of electric effects was that obtained by Wheatstone, at the rate of 230,000 miles per second, a velocity greater than that of light, which is between 165,000 and 180,000 miles per second.

**The Electric Transmission of Power** is the transmission of power to a distance by electricity, effected by employing the source of power to drive the *dynamo*, which

generates an electric current. This current is conveyed by a copper conductor insulated from the earth to the distant station, where it passes through a machine called an *electro-motor*, one part of which (called the *armature*) is thereby made to revolve, and imparts its motion to the machinery which is to be driven.

This is the simplest arrangement, and is that which is commonly employed when the original currents are not of such high tension as to be dangerous to life in the case of accidental shocks. When the original currents are alternating they are made to generate induced currents by means of an instrument called a *transformer*, which is similar in principle to an ordinary Ruhmkorff coil, with the important difference that the primary wire is long and thin, and the secondary wire short and thick.

These methods of transmission and transformation are employed not only for giving out mechanical power, but also for electric lighting.

**Distribution of Electricity** means the supplying of strong currents of electricity from central stations where they are generated, to houses, streets, lamps, etc., in their vicinity. The central station contains a few powerful dynamo machines, driven usually by steam-power. The positive and negative terminals of the dynamo are put in connection with the positive and negative main conductors which are to supply the district, and from these main smaller conductors branch off to the houses or lamps. In some systems of distribution, instead of the two main conductors being one positive and the other negative, each is positive and negative alternately, the reversals taking place some hundreds of times per second. The currents are then said to be *alternating*. When such reversals do not take place, the currents are said to be *direct*.

**Sources of Electric Energy.**—The chief sources of energy in practical use are coal, petroleum, wood, water at a height, and wind. Of these coal is by far the most important; water power comes perhaps next in importance; while the power of the wind is as yet almost undeveloped.

**Applied Electricity.**—The principal applications of electric energy are the lighting of streets and houses, the driving of machinery, the propelling of trains, street-cars, carriages, and boats, the heating of rooms, the heating of electric forges and furnaces, electro-chemical processes, various signaling operations, etc.

**The Dynamo.**—The dynamo is the most effective means for generating electricity. It costs about fifty times less to produce electricity by it than by batteries. It consists of nothing else than iron and copper wire, and when generating electricity some portion of the machine must be in rapid rotation.

The following characteristics of arrangement are to be noted:

(1) An outer iron ring [which remains stationary. Portions of this are wound with many turns of insulated copper wire. Its purpose is to furnish a strong magnetic field, and it is generally, though not always, called "the field."

(2) An inner mass of iron, arranged for rapid rotation. Portions of this also are wound with insulated copper wire. This is called the *armature*, while the other is called the field.

(3) A commutator, if the machine is to send out a *continuous current*. This consists of the ends of the conductors in the

moving armature arranged in a circle so that the two line conductors may be brought in contact with them, each serially by brushes rubbing over them as the armature rotates. If the machine has no commutator, it must send out an *alternating current*.

Before the days of the dynamo, electricity although well known was of little use. The dynamo has made practicable the following: (1) Electric lighting and heating. (2) Electric traction. (3) Electric motors for the manifold applications of power. (4) A large number of chemical industries which depend upon large electric currents for producing chemical changes; such, for example, as extracting aluminum from clay. (5) Storage batteries. (6) Electric welding. (7) The dynamo is rapidly displacing batteries for telephoning, telegraphing, operating clocks, bells, etc.

**Mechanics.**—Is that branch of physics which treats of forces and their applications. The tendency of force acting upon matter is to produce motion, but two such tendencies may oppose one another, as the direction of the motions which they seek to produce may differ. When two do not completely counteract one another, it is possible that three or four or any number of forces—so many of them acting in one general direction and so many in another, so many for instance trying to produce motion eastward, and so many motion westward—may produce no motion whatever. From the application of any number of forces there may be rest produced, and it is quite evident that there may be motion.

Mechanics treats these two cases, embracing in its sphere the theory, as well as practice, of motion and equilibrium, both with and without the aid of machinery. The theory of mechanics properly comprehends (1) dynamics; (2) the motion of projectiles; (3) the theory of simple machines, or the mechanical forces; (4) the theory of compound machines, and their maximum effects; (5) the doctrine of the center of gravity; (6) the doctrine of the center of oscillation, gyration, etc.; (7) the collision of bodies; (8) the theory of rotation; (9) the theory of torsion; (10) the strength of materials; (11) and lastly, the equilibrium of arches and domes.

The elementary machines, or mechanical powers, properly speaking, are six in number, and may be thus enumerated—the *lever*, the *wheel and axle*, the *pulley*, the *inclined plane*, the *wedge*, and the *screw*.

**Applied Mechanics** is the practical application of the laws of matter and motion to the construction of machinery, etc.

**Heat.**—Heat is sometimes called invisible light. It is conceived to be an ether vibration of a little longer wave length than light. When these waves strike against any substance they cause its molecules to vibrate rapidly, and as a result the substance expands, and sometimes melts, or perhaps evaporates, or, under the influence of the waves, it may undergo chemical change, either resolving itself into simpler substances or uniting with other substances to make more complex ones. These molecular motions may stimulate motions among the molecules of other substances at a distance through the intervention of ether waves. These ether waves, in passing upon our bodies give us the sensation of heat.

**Absorption.**—Substances whose molecules most readily respond to the heat vibrations of the ether are called good

absorbent of heat. The barefoot boy walking about a field has plenty of evidence that although the sun may shine alike on all substances, some of them get much hotter than others. The New York subway is much of it built underneath the streets with a comparatively thin roof of concrete over it. This concrete is a particularly good absorber of the sun's radiation and keeps the subway hot as a garret in summer.

**Applied Heat.**—Heating a stove oven is a good deal like lighting it. The walls of the oven send heat rays to the bread. If two loaves of bread set side by side in the oven each is in the shadow of the other and must be turned around occasionally to bake uniformly. The oven would bake quite as well without air as with it. Like light rays, heat rays pass better through a vacuum than through air. The most economical way of heating a house is by radiators, although this method is objectionable on the score of ventilation. Proper ventilation necessitates a wasteful method of heating our dwellings and public buildings.

Air is a particularly poor absorber, carrier, and radiator of heat. In our common thought we have given it far too much credit in the distribution of heat. When the walls, furniture, etc., of a room get warm, we may displace all the warm air in it by cold air—even freezing cold air—without its perceptibly affecting the thermometer.

**Conductors.**—There are no very good conductors of heat. With very great loss we do conduct electricity several miles by copper wires, but there is nothing which will conduct heat as many inches. The mystery is that copper wires should conduct or give direction to electric waves at all. Ice must absorb a very large amount of heat radiation before it can change to water, hence its usefulness in the ice box. Vast volumes of air may pass through the ice box without melting the ice, since air has so little capacity for heat radiation. Salt strangely assists ice in absorbing heat rays; hence ice which cannot freeze the cream alone, may, if mixed with salt, absorb the heat radiation from the cream quickly—changing itself to brine and reducing the temperature of the cream many degrees below freezing.

Water in changing to vapor absorbs a large quantity of heat radiation, hence boiling water in the double boiler may prevent the hottest flame from raising the temperature in the inner boiler above 212 degrees.

**Temperature.**—Changes of temperature are best measured by the expansion and contraction of a column of mercury in a glass tube. An arbitrary scale is attached to this. Freezing temperature is in this country indicated by 32 degrees. The temperature of boiling is 212 degrees. The temperature of the inner portion of the human body is 98 degrees. The proper temperature of a living room is about 64 degrees to 68 degrees. It seems to be necessary to our welfare that the internal heat of our bodies should be about 30 degrees above our surroundings when we are not exercising. Chemical action within raises the temperature and evaporation of moisture from the skin reduces the temperature. The balance is kept very constant amid a great variety of surroundings.

Volatile liquids, such as alcohol and gasoline, feel cold because they absorb our heat in changing their state from liquid to gas. In the fall of the year, when the

nights begin to be cold, paper tied over plants may keep them from freezing. Just as a paper shade may be put over a lamp to cut off its rays of light, so paper over the plant cuts off the heat radiation from the plant and prevents its getting cold enough to freeze.

**Light.**—It is now a quite universally accepted theory that light is a wave motion in the ether which pervades all space. A microscopic examination of the interior of the eye shows that, like the ear, it is adapted to respond to wave motions of extreme rapidity. The highest tone which the human ear is capable of responding to is produced by about forty thousand air waves per second coming in upon it, but the human eye responds to nothing short of four hundred trillion ether waves per second.

**Color.**—As sound has tones of various pitch, so light has various colors. The sensation which we get from the tone called middle C on the piano is produced by 256 air waves each 4 feet long beating upon the ear each second. 512 air waves each 2 feet long (that is, twice the number each half as long) beating upon the ear each second will give the sensation of the tone called C, one octave above middle C.

**Red.**—So the eye is stimulated to the sensation of red by having 400 trillion ether waves each  $\frac{1}{100,000}$  of an inch in length borne in upon it each second, while twice that number of ether waves per second each of half the length will give the eye the sensation of violet at the other end of the spectrum. The sensation of heat is produced by ether waves longer than the red, and ether waves shorter than the violet produce chemical change, such as tanning the skin, fading our garments, fogging the photographic plate, making the green material in plants, etc.

**Reflection.**—Light waves are reflected from all objects in the same manner that sound waves are, or indeed as water waves are. All objects which we see are either themselves stirring up waves in the ether or are reflecting ether waves which have been sent out from other sources. When six amperes of electricity are sent through a piece of number 24 iron wire, the wire sends forth in great abundance those ether waves which we call heat, but no light waves. Seven amperes of the electric current will cause it to send forth those ether waves which will affect the eye with red light and we call it red hot. Eight amperes will cause it to send forth violet ether waves, which, mingled with the red, will produce white light, and we say the iron wire is white hot.

**Refraction.**—Light waves pass through glass much more readily than heat waves do. Hence a glass screen before an open fire allows one to see the fire without heating his face scorched. Glass, however, offers some resistance to the passage of light waves and hence when these waves strike upon a disk of glass which is thicker at the center than at the edges (such a piece of glass is called a lens), the waves are retarded at the center and the outer portions of the waves are turned inward so that they are concentrated at a point, or focus, on the other side of the lens. This bending of the waves is called *refraction*.

A large size lens, sometimes called a burning glass, serves in this way to concentrate the sun's light and heat waves to an intensely bright and hot point which may cause wood or paper to burn. The red light waves being akin to heat waves are

retarded more than violet waves in passing through glass.

**Spectrum.**—Thus in passing white light, which is a combination of all colors, through a glass prism, the red waves are turned from their course more than any of the other colors and the violet is refracted least.

**Prismatic Colors.**—The colors thus shown are usually said to be seven—red, orange, yellow, green, blue, indigo, violet; although in reality there is an enormous, if not an infinite, number of perfectly distinct colors in light. The seven colors are frequently called the primary colors, and other tints and shades are producible by mixing them; but in a stricter sense the primary colors are three in number, namely, red, green, and violet (or blue). These three colors or kinds of light cannot be resolved into any other.

In the scientific sense of the word white and black are not considered colors, a white body reflecting, and a black body absorbing, all the rays of light without separating them, whereas the colors proper are due to separation of the rays of light by partial absorption and reflection or by refraction. If a body absorbs every other kind of light and reflects or transmits red light only, it will appear of a red color; if it absorbs every kind except blue rays, it will appear blue; and so on. If more than one kind of light be transmitted or reflected, the object will appear of a color compounded of these different rays of light.

**In Painting,** the term color is applied to that combination or modification of tints which produces a particular and desired effect. The colors of the spectrum have to be distinguished from colors used in reference to pigments.

**Primary Colors.**—The pigments red, blue, and yellow, regarded in the arts as the primary colors, produce effects, when mixed, very different from those produced by admixture of the corresponding spectrum colors. These three pigment colors form other colors thus: Red and yellow make orange, yellow and blue make green, and red and blue make purple; but red, blue, and yellow cannot be produced by any combination of the other colors.

**Local Colors** are those which are natural to a particular object in a picture, and by which it is distinguished from other objects.

**Neutral Colors** are those in which the hue is broken by partaking of the reflected colors of the objects which surround them.

**Positive Colors** are those which are unbroken by such accidents as affect neutral objects.

**Complementary Colors** are colors which together make white; thus any of the primary colors is complementary to the other two.

**Subjective or Accidental Colors** are the imaginary complementary colors seen after fixing the eye for a short time on a bright-colored object, and then turning it suddenly to a white or light-colored surface.

**In Heraldry,** the colors used are generally red, blue, black, green, and purple; which are called *gules*, *sable*, *vert*, *or*, and *purpure*. *Tenne*, or tawny, and sanguine or blood-color, sometimes occur, but they are not common. Yellow and white, again, are not colors in the heraldic sense, but metals; they are called *or* and *argent*, and are always represented by gold and silver. It is a fundamental and invariable rule in blazon not to put color upon color, or metal upon metal; thus, if the field be of a metal, the bearing must be of color, and vice versa.

## CHART OF COLOR HARMONIES

In Decoration, Dress and Ornamentation

	Blue	Brown	Green	Orange	Gray	Black	White	Yellow	Pink	Red	Purple	Gold	Silver	Steel	Iron	Lead	Copper	Brass	Aluminum	Platinum	Gold	Silver	Steel	Iron	Lead	Copper	Brass	Aluminum	Platinum	Gold	Silver	Steel	Iron	Lead	Copper	Brass	Aluminum	Platinum
Blue	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Brown	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Green	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Orange	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Gray	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Black	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
White	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Yellow	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Pink	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Red	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Purple	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Gold	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Silver	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Steel	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Iron	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Lead	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Copper	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Brass	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Aluminum	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Platinum	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

**Sound and Musical Instruments.**—The most noticeable thing about instruments for producing sound is that they are all devices for causing the air to vibrate, and the most interesting thing about the inner ear is that it is evidently a mechanism for receiving and responding to air vibrations. If no air intervenes between the ear and the sounding body no sound can be heard. This is shown to be true by operating an alarm clock or an electric bell in a closed vessel from which the air has been exhausted.

**Intensity.**—Most instruments for producing sound have some sort of device for reinforcing or intensifying the sound. The jewsharp is a simple reed, or steel spring fastened to a convenient handle. When this reed is made to vibrate, by plucking it with a finger, it emits a faint sound. This sound is intensified by holding it between the lips before the cavity of one's mouth.

**Pitch.**—Close attention will reveal the fact that the shorter reeds vibrate faster, and hence the pitch of a tone is related to the rapidity of the vibrations which produce it. The short tuning forks vibrate faster than the long forks and produce tones of higher pitch. These tones are heard only faintly until they are reinforced. This may be done by holding the fork, while it is vibrating, before the mouth of a suitable sized bottle, or by pressing the stem of the fork upon a table, or, better, upon a thin wooden box of certain dimensions which will act, like the body of a violin, as a resonator.

One type of music box has a steel comb with teeth of various length. A cylinder with teeth revolves so as to pluck the various teeth of the comb and produce sounds of various pitch.

**Reeds.**—The harmonica has brass reeds of various length. The mouth of the operator both causes the reeds to vibrate

by forcing streams of air over them and furnishes a cavity which reinforces the sound. The mouth moves from right to left to bring into operation the reeds of different length. An accordion is an harmonica with bellows attached to be worked by the hands. This leaves the mouth of the player free to sing to the accompaniment of his instrument if he chooses. Keys are provided by means of which the player may direct streams of air to whichever of the reeds he chooses. A reed, or cabinet organ, is the next step in the evolution of this instrument. In this the bellows are worked by the feet, leaving the hands more free to play the keys.

**Strings.**—The harp has strings to produce air waves, long strings to vibrate more slowly and produce the low tones and short strings to vibrate faster and produce the high tones. The high-toned strings are likewise thinner and tighter than those which produce the low tones. It is generally true of all stringed instruments that high tones are produced by short, tight strings, while those which produce the lower tones are relatively longer, thicker and looser.

A piano is like a harp with a "sounding board" attached. This sounding board acts like the body of a violin to intensify the sound. The player upon a harp causes the strings to vibrate by plucking them with his fingers, while the strings of a piano are made to vibrate by hammers which the player operates by means of the keys.

Viols, violas, guitars, mandolins, banjos, violoncellos, and bass viols, etc., all have thin and tight strings for the high tones and thick, loose strings for the low tones, but the player changes the length, and hence the pitch, of each by fingering it. Some strings are wound with wire to make them thicker and heavier and hence vibrate more slowly.

**Tones.**—When a player puts his finger at the middle point of the string it vibrates in two separate sections, each section vibrating twice as fast as before and the pitch of its tone is raised one octave. By skillful manipulation a string may be made to vibrate in halves, in thirds, in quarters, in fifths, and in sixths, and the vibrations of these various sections will be two, three, four, five, and six times as rapid as those of the whole string. The most curious fact is that a string may vibrate in all these ways at once.

**Classes of Tones.**—The tone produced by the string vibrating as a whole is called its fundamental and the tones produced by its various segments are called overtones. The most pleasing sounds are those in which the greatest number of overtones abound. The most famous players are those who are most skilled in producing overtones and the most highly valued instruments are those most capable of yielding rich combinations of overtones.

An interesting relationship exists between a series of overtones and their fundamental. If we take, for example, a string whose length, tension and thickness are such that when it vibrates as a whole it gives the tone designated as C—the middle C of the piano—produced by 256 vibrations per second, the relationship of its overtone is shown by the following table:

Fundamental C, in the middle of the piano 256 vibrations per second.  
1st overtone, C, 1 octave above C (2×256) = 512 vibrations per second.  
2d overtone, G, 1½ octaves above C (3×256) = 768 vibrations per second.  
3d overtone, C, 2 octaves above C (4×256) = 1,024 vibrations per second.  
4th overtone, E, 2¼ octaves above C (5×256) = 1,280 vibrations per second.

5th overtone, C,  $2\frac{1}{4}$  octaves above C ( $6 \times 256 = 1,536$  vibrations per second).

**Wind Instruments.**—The so-called wind instruments, such as the organ pipe, the various horns, etc., are devices for producing air waves without the intervention of reeds or strings. A strong wind blowing across the top of a chimney causes the column of air within to vibrate until the chimney roars. In like manner the column of air in an organ pipe is made to vibrate by a stream of air blowing, not through the pipe but across one end of the column. The flutist blows, not into his flute but across one end of it.

**Relation of Pitch to Length of Pipe.**—A two-foot open pipe produces middle C, the tone of 256 vibrations per second. A similar pipe one foot long produces C<sub>2</sub>, one octave above middle C. While one four feet long produces C<sub>3</sub>, an octave below middle C. This is true whether the pipes are straight, as in the case of most organ pipes, or curled up as in the case of most horns. A French horn with

eight feet of pipe coiled up will produce C<sub>2</sub>, two octaves below middle C. The trombone has sliding joints for changing the length of the tube and thus giving a variety of tones. The flute has holes along its sides which have the effect of changing the length of the air waves, and hence the tones produced. The cornet has three extra loops of pipe, each of which may be added to the whole length of tube by pressing down a key.

This would account for a few extra tones, but how can a pipe with only three keys produce, say, thirty tones? The answer is that these instruments are the most marvelous devices for bringing out overtones. The player, by slightly changing the shape of his lips and varying slightly the wind pressure may make the air column in the instrument vibrate as a whole or in halves, or thirds, or fourths, or fifths or sixths. The scale for a French horn eight feet long whose fundamental is C<sub>2</sub>, is shown in the following table (read from the bottom upward):

	0	2	1	3	2 and 3	1 and 3	1, 2 and 3
384 vibrations per second	G	...	...	...	...	...	...
	F <sub>1</sub>	...	...	...	...	...	...
320 vibrations per second	E	...	...	E	...	...	...
	D <sub>1</sub>	...	...	D <sub>1</sub>	...	...	...
	D	...	...	D	...	...	...
256 vibrations per second	C	...	...	C <sub>1</sub>	...	...	C <sub>1</sub>
	B <sub>1</sub>	...	...	B <sub>1</sub>	...	...	...
	A <sub>1</sub>	...	...	A <sub>1</sub>	...	...	A <sub>1</sub>
	A <sub>2</sub>	...	...	G <sub>1</sub>	...	...	...
192 vibrations per second	G <sub>2</sub>	...	...	G <sub>2</sub>	...	...	G <sub>2</sub>
	F <sub>2</sub>	...	...	F <sub>2</sub>	...	...	F <sub>2</sub>
	F <sub>3</sub>	...	...	E <sub>2</sub>	...	...	...
	E <sub>3</sub>	...	...	D <sub>2</sub>	...	...	...
	D <sub>3</sub>	...	...	D <sub>3</sub>	...	...	...
128 vibrations per second	C <sub>3</sub>	...	...	C <sub>3</sub>	...	...	C <sub>3</sub>
	B <sub>2</sub>	...	...	A <sub>2</sub>	...	...	...
	A <sub>3</sub>	...	...	A <sub>3</sub>	...	...	...
	A <sub>4</sub>	...	...	G <sub>3</sub>	...	...	...
	G <sub>4</sub>	...	...	G <sub>4</sub>	...	...	...
	F <sub>4</sub>	...	...	F <sub>4</sub>	...	...	...
	E <sub>4</sub>	...	...	E <sub>4</sub>	...	...	...
	D <sub>4</sub>	...	...	D <sub>4</sub>	...	...	...
	C <sub>4</sub>	...	...	C <sub>4</sub>	...	...	...
84 vibrations per second	C <sub>4</sub>	...	...	C <sub>4</sub>	...	...	C <sub>4</sub>
	B <sub>3</sub>	...	...	A <sub>3</sub>	...	...	...
	A <sub>4</sub>	...	...	A <sub>4</sub>	...	...	...
	A <sub>5</sub>	...	...	G <sub>4</sub>	...	...	...
	G <sub>5</sub>	...	...	G <sub>5</sub>	...	...	...
	F <sub>5</sub>	...	...	F <sub>5</sub>	...	...	...

† Sharp.

The column headed 0 shows the fundamental and overtones which may be produced when none of the keys are pressed. The second column shows the series of tones which may be produced when the second key is pressed. This lengthens the tube sufficiently to depress each note in the series half a tone. The next column shows the series produced when the first key is pressed. The next the series obtained by using the third key, and the remaining columns by combinations of the second and third, first and third, and finally the first, second and third keys.

It will be noticed from this table that the player upon a horn with only three keys is able to produce every tone and half-tone in something over two octaves

and that he has two different ways of getting nine of these tones.

**Conversational Tones.**—The tones which men use most frequently in conversation fall within an octave of C<sub>2</sub>—128 vibrations; while the tones most frequently heard in female conversation are near to middle C—256 vibrations.

One might sing by waving his hand in the air if he could wave it fast enough. He might fill a large hall with his music by waving his hand at the mouth of a suitable sized bottle as resonator. He might even fill the hall with people if he could wave his hand skillfully enough to produce a rich combination of overtones.

**Speed of Sounds.**—All sounds, whether high or low, loud or soft, travel at the same

rate of speed through the air, else the music of the band would not sound well in the distance. One may see a steamship blow its whistle two miles distant and count ten seconds before hearing its sound. The sound waves travel a mile in five seconds, or 720 miles an hour. In rifle practice one, standing near the target, may hear the bullet hit the target before he hears the discharge of the gun, and frequently he hears the same sound waves several seconds later reflected back to him from the distant hills in echo.

Terrific explosions upon the sea send light waves to us through the ether in eight minutes, but there, no air to bring the sound tones. If there were air and if the sound could come to us without loss it would require fifteen years for the journey.

**Range of Tones.**—The range of the tones of a piano is usually from  $2\frac{1}{4}$  vibrations per second to 4,096 vibrations per second. Between these limits are all the tones which may be called musical. Many persons who hear perfectly well tones within the range of the piano are totally deaf to a tone one octave above the highest tone on the piano, and all persons are incapable of hearing sounds whose pitch is higher than three octaves above the piano. It requires other apparatus than the human ear to detect them.

**ZOOLOGY** is that half of biology, or the science which treats of life and living things, that deals with animals. It is impossible to frame a definition of animal, for although we can distinguish between a cow and a cabbage, the simpler forms of animals grade into the plants. Indeed, there are forms which at one period of their life would be classed with the animals, at another with the plants.

Animals may be studied from many standpoints and there have thus arisen different subdivisions of zoology, each of which has its own name. Thus *anatomy* deals with the gross structure, *histology* with the minute anatomy, *embryology* or *ontogeny* with the development from the egg, *physiology* with the way in which the parts perform their functions. The term zoology is usually restricted to the recent animals, the fossils forming the province of paleontology, or, better, paleozoology.

The classification of animals, or taxonomy, is based upon structure and development (morphology), the attempt being made to arrange the species into groups of different grades so as to show their actual relationships which are the results of their lines of descent (phylogeny). Then there is the subject of geographical distribution, while the special study of several groups has been dignified by special names, like ornithology (birds), ichthyology (fishes), entomology (insects), and malacology (mollusks).

**Classification.**—The animal kingdom is divided into groups of different values, the series beginning with phyla and ending with species or varieties, the relative rank of these being:

Phylum, divided into classes.

Class, divided into orders.

Order, divided into families.

Family, divided into genera.

Genus, divided into species.

Species, represented by individuals.

There are besides, intermediate grades like super and sub families, suborders, legions, etc. Each of those divisions has its name in Latin form, those of the orders frequently ending in *oides*, those

of families in *idae*. These groups are not readily defined. We say that a species consists of those individuals which are very closely alike and which will interbreed, while the genus is based on more general characters.

Each animal has a double name, in Latin form, the first word representing the genus, the second the species. Thus all cat-like animals are included in the genus *Felis*, while the species name indicates the kind of cat. Thus the lion is *Felis leo*; the tiger, *Felis tigris*; the wildcat, *Felis caten*; and the domestic cat is *Felis domesticus*. These names enable naturalists in all countries to understand exactly what form is meant, and to a certain extent they indicate the relationships of the animals.

All animals are divided, at first, into two great groups of subkingdoms, the *Protozoa*, in which the whole animal consists of but a single cell, and the *Metazoa*, in which the body is composed of multitudes of cells.

**Protozoa.**—As the *Protozoa* are single-celled animals they are all small, only a few being visible to the naked eye. All of the functions of life are carried on by the one cell, and hence these animals have great interest for the student, as they show the simplest kind of organization and also the great variety of shapes possible in a single cell, for thousands of these forms have been described. Most of the *Protozoa* reproduce by dividing into two, but there are some in which the body breaks up into great numbers of small particles or *spores*, each of which is capable of growing into an animal like the parent.

**Porifera.**—The sponges, the lowest of the *Metazoa*, bear this name because the surface of the animal is covered with numerous pores. These are the openings to canals by which water and food pass into numbers of small sacs which act as stomachs and from which one or more larger canals carry the water and the waste to the exterior. The familiar bath sponge is only the skeleton from which the flesh has been washed away, but it is always possible in this to recognize the outgoing canals. The best of the commercial sponges come from the Mediterranean, those of Florida and the West Indies being of a coarser character.

**Coelenterata.**—This phylum consists of the hydroids, jellyfishes, sea anemones and corals, in all of which the cells of the body are arranged in two layers, one forming the external skin, the other the lining of the digestive tract. There is but a single opening into the body, and this serves as both mouth and vent. There is but a single cavity inside the body and this is at once digestive and circulatory.

The *Hydrozoa* have an interesting life history. There is one stage in which the animals are fixed to some submerged object, and by a process of budding they develop into large colonies of individuals connected together by a common stalk. Each individual has tentacles armed with nettle cells around the mouth, by means of which it kills its prey. The digestive cavity is continued through the stalk, connecting all of the individuals. At certain places, varying with the species, other buds are formed. These resemble a bell in shape and have a mouth at the end of the tongue. Each of these bells soon separates from the parent and swims away as an independent animal.

The description above applies to the subclass *Hydrozoa*; in the *Siphonophora* we have colonies of jellyfish, connected by a hollow stem, and the fixed stage is absent. Most of the *Hydrozoa* are small, the individuals of the colony usually measuring but a fraction of an inch in length, while the medusae are rarely an inch across.

The *Scyphozoa*, also include fixed and free forms. The fixed forms, called *Actinozoa*, are cylindrical animals, attached by one end and bearing a circle of tentacles around the mouth at the other. Internally there is but a single cavity, but this is divided by radial partitions into a series of chambers, thus greatly increasing the digestive surface.

The sea anemones, which are usually brightly colored, form no hard parts, and each individual is usually distinct.

In the *corals* there are some forms which are solitary, but usually the coral individuals reproduce by partial division, so that large colonies (sometimes several feet across) may occur. In these the base and usually the sides of each animal secrete a skeleton of carbonate of lime, the secretions of the adjacent individuals joining, so that large masses of coral result. In most of the species this skeleton is porous, but in the precious corals (occurring mostly in the Mediterranean and in Japan) it is dense and takes a high polish. Its color ranges from white to deep red.

The scyphozoan jellyfishes may attain a distance across of six feet, with tentacles a hundred feet in length. All pass through a fixed stage, like a sea anemone, which becomes cut across, each portion forming a jellyfish.

The *Ctenophora* are distantly related to the other jellyfish. Most of them are spherical and all have eight rows of swimming organs, arranged like the meridians on a globe. Each row consists of plates of tentacle hairs, each plate roughly resembling a comb, when the *Ctenophora*, which means comb-bearer. These forms are very voracious, holding the prey by means of numerous adhesive bodies which replace the nettle cells of the other *Ctenophora*.

The *Platodes* (flatworms) have elongate flattened bodies, and with the exception of the *Acantharia*, have but a single opening (mouth) to the alimentary canal, which is the only cavity in the body. (In a few of the *Turbellarians* and in all of the *Cestodes* there is no digestive cavity.)

The *Turbellaria* are small forms occurring in both fresh and salt water, only a few being airmen parasites on other animals. The *Trematoda* on the other hand are all parasites, some living on the outside, others in the interior of other animals, sometimes causing severe disturbances and even death. Some of the internal parasites have strange life-histories, the immature stages being passed in the bodies of mollusks, the adults occurring in the organs of vertebrates. The life history is best known of the liver fluke of the sheep, which killed a million and a half of sheep in England in a single year. Other species may attack man, especially in warm climates.

The *Cestoda*, commonly called tapeworms, are all internal parasites, and this method of life in the intestine of other animals has resulted in a complete loss of the digestive and nourishment being absorbed through the surface of the body. Usually

these animals pass through two different hosts, the common tapeworms of man passing the immature stages in the pig or cow; less common is one which lives a part of its life in fishes. The immature stages of these are taken with uncooked flesh into the human stomach, where they are set free and then they attach themselves to the lining of the intestines and gradually grow into the adult, becoming divided into a series of joints, each of which is composed almost exclusively of reproductive organs.

The *Nematoda* are nonparasitic forms occurring in salt and fresh water. They differ from the other *Platodes* in having a vent to the digestive tract. They have little interest except for the student.

The *Rotatoria* (rotifers or wheel animals) are microscopic animals occurring in the water, in which a circle of cilia around the mouth is in constant vibration, giving the impression of a wheel in rapid rotation.

The *Coelhelminthes* include worms in which there is a well-developed body cavity surrounding the digestive tract, which always has both mouth and vent.

The *Nematoda* (round or thread worms) are cylindrical and have no jointing of the body. Some live in moist earth or in the water, but the great majority are parasites in man and other animals, some of them causing severe disturbances or even death. The human parasites longest known are the stomach and pin worms (*Ascaris*). Much more serious is the *Trichina*, not over a sixth of an inch in length, which man obtains from raw pork and which is frequently found when occurring in large numbers. Another *Nematode* is *Ankylostomum*, the so-called lay worm which occurs in the Southern states, while many less known forms attack man in the tropics. All of these, as well as the *Trematodes* and *Cestodes* obtain entrance to the body with food or water; hence the rule should be not to eat flesh raw, but to cook it in the usual condition. Salads are also a frequent source of infection.

The *Annelida* are worms in which the body is divided into a series of rings or segments, one or more of the anterior rings being differentiated into a head, usually bearing eyes and other sense organs. It also contains the mouth, which may be provided with jaws. Among these *Annelida* are the earthworms, of great use in working over the soil, and a number of small forms living in fresh water. But the great majority of the *Annelida* live in the sea, some of them brilliantly colored. The earthworms have no appendages, but many of the marine species have a pair of fleshy appendages which serve as oars on each segment of the body. None of the *Annelida* are parasitic and none have much economic importance.

The *Polychaeta* (*Brachyochaeta*) are minute colonial forms whose relationship to the other *Coelhelminthes* can only be recognized by careful study. Only a few live in fresh water, the great majority being marine.

**Echinodermata.**—The members of the phylum *Echinodermata* also have a large body cavity. They derive their name (which means spiny skin) from the fact that the skin contains numerous calcareous plates, an unusually these plates bear numerous spines which protect the animal. There is a complete alimentary canal, with mouth and vent, and the other parts of the body are arranged on the plan of five, radiating from the axis

connecting mouth and vent. Around the mouth is a ring canal filled with fluid, which gives off branches to each of the radii of the body, and connected with these radial canals are peculiar structures, the tube feet, used in locomotion. All of the *Echinodermata* are marine.

**Asteroida** (or starfish) have a central disk, with the mouth on the lower side, and radiating from this, like the spokes of a wheel, are the arms with the tube feet on the lower surface. Starfish feed largely on mollusks and prove great enemies to oyster beds. They have great powers of regeneration and lost arms are rapidly replaced.

**The Ophiuroidea** (brittle or serpent stars) differ from the other starfish in the more slender arms and in the sharper line between arms and disk.

**Crinoida** (or sea lilies) have both arms and disk and are attached to the sea bottom by a stalk arising from the disk on the side opposite the mouth. Thus they live with the mouth uppermost, the branched arms forming a funnel, conveying food to the mouth. There are only a few species of Crinoida living, but their skeletons are very abundant in the older rocks, where there also occur two related groups, the *Cystoida* and *Blasidoida*, now extinct.

**The Echinoidea** include the sea urchins. These are usually spherical, with the parts arranged as if the arms of a starfish had been folded up over the back, the rays being still distinguishable, each bearing its row of tube feet. The body wall is very strong and the spines are movable, aiding in locomotion. Several species are eaten in Europe. Other species, like the sand dollars, are flattened, and still others are heart shaped, with a marked bilaterality.

**The Holothuroidea** include the sea cucumbers, which may be compared to a sea urchin, long drawn out between mouth and vent, so that the body is cylindrical. Spines are rare. In the eastern seas some species are taken, dried, and, under the name of trepang, are sent to China, where they are used as a basis for soups.

**The Mollusca** derive their name from the fact that the body is soft, a matter of little importance. The clams, oysters, snails and squids forming the group have the body cavity greatly reduced; they lack a segmentation to the body; on the lower surface is a projecting part, the foot, while on either side is a fleshy lobe called the mantle, which usually has the power of secreting a shell. This shell, in some forms belonging to several groups, has such a structure that it has an iridescent appearance, and is called mother of pearl. Such mollusks have also the power of forming true pearls, but the majority of pearls come from the pearl oyster of tropical seas.

**The Amphineura** include the *Chitons* of the seashore, in which the foot is a broad, creeping disk, while the shell consists of eight overlapping plates on the back.

**The Acalepha** have a bivalve shell, the two halves being right and left. Just inside the mantle are two pairs of leaf-like gills, while the foot is a muscular organ projecting from the ventral surface and is used in boring, creeping, and in a few even for leaping. Here belong several forms of economic importance, including the shipworm or *Teredo* (which does great damage to submerged wood), and the oysters, clams, scallops and mussels which serve for food.

Of the scallops the part eaten is the muscle which closes the two halves of the shell. There are two edible clams on our eastern coast. The oyster is found to-day in the Gulf of St. Lawrence and from Cape Cod south, but not in the intermediate region. The fresh-water mussels (*Uniona*) have a pearly shell, and large numbers (65,000 tons a year) are used in the Mississippi valley in the manufacture of pearl buttons.

**The Scaphopoda** (or tooth shells) are shaped like an elephant's tusk. All are marine and none is of any economic importance.

**The Gastropoda** have a broad creeping foot on the lower surface and a single shell, usually coiled in a spiral. (In a few the shell has been lost.) There is usually a single gill; a few have two; while in the land snails the gills have been lost, their place being taken by a so-called lung. Few of the group have any economic value. A few are eaten; some of the land snails destroy vegetation and some of the marine species eat oysters and other shellfish. Some shells are used for cameo engraving and one of the cowries passes as money in some parts of Africa. In a few species there are glands, the secretions of which become red or purple on exposure to the air. The celebrated Tyrian purple of the ancients was derived from one of the *Gastropoda*. The *Helicopoda* and *Oteropoda*, often given as distinct groups, are really aberrant *Gastropoda*.

**The Cephalopoda** have a circle of eight or ten (in *Nautilus* about a hundred) tentacles, usually bearing suckers, around the mouth. They have a muscular mantle and either a single external shell or a rudimentary one concealed within the body. The cuttle bone fed to cage birds is the internal shell of the form known as the cuttlefish. Another feature common to the group is the ink sac which secretes the ink, a colored fluid used in clouding the water when the animals wish to escape from some enemy. This ink of one species forms the pigment sepia. All of the *Cephalopoda* are marine. In the seas of Newfoundland and Japan there are immense species, one measuring twenty feet in length, with tentacles thirty-five feet long. Chambered shells, belonging to extinct species (*Ammonites*, *Goniatites*, *Orthoceras*, etc.), are common in the rocks.

**Arthropoda**.—The members of this phylum differ from the *Annelida* chiefly in the reduced body cavity, the differentiation of the segments into regions (usually head, thorax and abdomen), and in having jointed appendages, specialized for sensory purposes, for eating, for locomotion and for reproductive and protective purposes. All have the segmented body and the presence of compound eyes is common.

**The Crustacea** are mostly aquatic, breathing by means of gills attached to some of the appendages. Usually the head and thorax are united in a cephalothorax, but the abdomen is distinct and two pairs of appendages are in front of the mouth. Here belong the barnacles (*Cirripedia*) of our shores, the minute *Copepoda* which occur in such enormous numbers in fresh water and in the sea as to be an important food supply for fishes; and the *Decapoda*. This last division, characterized by having five pairs of walking feet, contains the lobsters and crabs, important elements in our food supply.

**The Acrota** have only six pairs of appendages attached to the cephalothorax. The class includes the horseshoe crabs of

the ocean and the spiders and scorpions of the land. The scorpions of the warmer climates have a poison sting at the end of the abdomen which is rarely if ever fatal to man. The spiders are celebrated for their spinning powers, the silk coming out of two or three pairs of glands at the end of the abdomen, each species spinning its peculiar type of web. The first pair of appendages of the spiders contain the poison glands. Allied to the spiders are the mites, common on plants, and the ticks, which are a pest in warm climates.

**The Malacostraca** include a few tropical animals (*Peripatus*) which are interesting to naturalists from their primitive structure, as they show many resemblances to *Annelida*.

**The Insecta** breathe by air tubes (tracheae) which open on the sides of the body and ramify the interior. They have a head with four pairs of appendages, only one pair, the antennae or feelers, being in front of the mouth, the others being subservient to eating. These latter, the mouth-parts, may be adapted for biting or they may be adapted to form a tube suited for piercing and sucking, in the case of the mosquito. The *Insecta* include the *Hexapoda* and the *Chilopoda*. (See *Entomology*.)

**The Chordata**, the highest phylum of the animal kingdom, include animals of very different appearance, but all of them, in either the young or the adult, have the following features: There is an early axial skeleton, the notochord, lying between the digestive canal and the central nervous system; there are gill slits extending from the pharynx to the exterior, and the central nervous system is confined to one side of the alimentary canal. There are four great divisions or subphyla—*Leptocardii*, *Tunicata*, *Enteropneusti*, and *Vertebrata*.

**The Leptocardii** include a few fish-like forms (*Amphioxus*) in the sea, in which the notochord and the only skeleton, even a skull being absent. They are of great interest to naturalists from their simple structure.

**The Tunicata** are also marine. In the young stages they are tadpole shaped, but when they become adult, they are sacular attached forms, commonly called sea squirts, from the way in which they eject water from the two openings in the body wall. In some the animals reproduce by budding, so that colonies of many individuals result.

**The Enteropneusti** are worm-like forms with no interest except for the zoologist.

**The Vertebrata** have a backbone composed of vertebrae formed around the notochord; the brain is enclosed in a skull, and has five regions, and usually there are two pairs of appendages. In the lowest vertebrates, the *Cyclostomes* (lampreys and hagfish), there are no jaws nor paired fins. All other vertebrates have true jaws and hence are called *Gnathostomes*.

**The Pisces** (or fishes) are aquatic, breathing throughout life by gills. Their appendages are fins and they have a two-chambered heart. Here belong the sharks (*Ela-mobranchia*), the *Ganoids* or garpikes and sturgeon, the bony fishes or *Teleostei*, including all of the common fishes, and the lung fishes (*Dipnoi*), in which besides gills, lungs are developed.

**The Amphibia** include the salamanders, newts, frogs and toads. The embryo is by means of gills in the young stages, while in the adult they have lungs and usually the gills are absorbed. Except the *Cecilians*, they have legs in the place



of fins. All live on the earth or in fresh water, not a single species occurring in the sea.

**The Cyclostomes, fishes and Amphibia** are grouped together as *Ichthyopsida* (fish-like), as they breathe by gills for at least a part of their lives. The remaining groups of vertebrates are included under the head of *Amniota* from the fact that they have a peculiar envelope, the amnion, which appears in the development.

**The Sauropsida** include the reptiles and the birds which agree in having scales on the whole body or upon the legs (birds) and in a number of peculiarities of the skeleton. The *Reptalia*, besides the scales, have a heart with three chambers (one partially divided in the crocodiles) and are cold blooded, or, better, have a blood of the same temperature as the surroundings. Of recent forms there are the groups of turtles (*Chelonina*), snakes (*Ophidia*), lizards (*Lacertina*), and crocodiles and alligators (*Crocodylia*). In geologic time there were several other groups, some including enormous animals (*Dinosauria*) and some that were capable of flight (*Pterodactyla*). The birds or *Aves* are marked off from all other animals by the feathers. All of them lay eggs and all have a four-chambered heart and the blood is always of the same temperature (warm blood), no matter what the surroundings. About twelve thousand different species of birds are known, nine hundred in North America.

**The Mammalia** are as sharply marked off by the presence of hair and by the presence of milk glands, by the secretions of which the young are nourished. They also have a four-chambered heart and blood of a constant temperature. The lowest group (*Monotremata*), occurring only in the Australian region, lay eggs, but all other mammals bring forth living young.

The *Marsupialia*, represented in America by the opossum, in Australia by the kangaroo, wombat, and a number of other forms, have a pouch (marsupium)

on the ventral surface in which the young are carried for some time after birth.

**Placentalia**.—All other mammals have a peculiar structure in their early development, known as the placenta, and hence they are grouped as the *Placentalia*. There are twelve orders of these.

(1) The *Edentata*, in which the teeth are poorly developed or are lacking and the toes are clawed. Here belong the anteaters, sloths, etc.

(2) The *Insectivora* are small animals (shrews, moles, hedgehogs) which largely feed upon insects.

(3) The *Chiroptera* (or bats) have the fingers greatly elongated and connected by membrane, the whole forming a wing. Most species are insect feeders, but some are fruit eaters in the tropics of the old world.

(4) The *Rodentia* (or gnawers) have two or four chisel-like teeth in each jaw, and clawed feet. Here belong the rats, mice, squirrels, beaver, porcupines, rabbits and hares.

(5) The *Ungulata* have hoofs on the tips of the toes and are herbivorous. They are subdivided accordingly as the feet have an odd or an even number of toes. To the odd-toed group belong the tapirs, rhinoceroses and horses. The even-toed group includes the hippopotamus, pigs and camels, as well as a large number of species grouped as *Ruminantia* because they chew the cud. The giraffes, deer, elk, cattle, buffalo, sheep, goats, and antelopes belong here. As will readily be seen, the *Ungulata* is the most important group of mammals from the standpoint of human interest.

(6) The *Proboscidea* includes the elephants, of which two species are now alive. In these the nose is drawn out into the well-known trunk and the upper incisors grow into the familiar tusks. In former times the group was larger, including the mammoths and mastodons, much like the elephants, and the dinotherium, in which the tusks were in the lower jaw.

(7) The *Hyrcacoidea* include a few

species from the old world, one of which is supposed to be the corner of the bible.

(8) The *Sirenia* are aquatic mammals with the fore limbs fin-like and the hinder ones lacking. The manatee and the dugong represent the group.

(9) The whales, or *Cetacea* externally resemble the *Sirenia*, but they are separated by several anatomical points. The whales are the most aquatic of all mammals and have almost entirely lost the hair, one species having only a scanty mustache in the young stage. The tail is flattened into a caudal fin which differs from that of any fish in being horizontal.

There are two great groups of *Cetacea*, the one having teeth, the other lacking them. To the toothed group belong the dolphins, blackfish, sperm whales and the narwhal. The sperm whales have an enormous mass of a peculiar fat (spermaceti) on the upper side of the head; the narwhal has a single tooth drawn out into a long twisted spine projecting from the front of the head. The toothless whales have a peculiar series of horny plates developed from the roof of the mouth. These form a strainer by means of which the animals are able to strain the minute life on which they feed from the water. This is the whalebone so important in woman's apparel.

(10) The *Carnivora* are the flesh eaters which prey on all other mammals. They have clawed feet and teeth adapted to a diet of flesh. Most of the species are terrestrial, and here may be mentioned the hyenas, raccoons, mink and weasel, ermine, otters, dogs, foxes, bears, and all of the cat tribe. Some of the *Carnivores* have taken to the water and have become almost as aquatic as the whales. These are the seals, sea lions and walruses. As will be seen, the group of *Carnivores* is possibly the most important source of furs, the *Rodentia* only approaching it.

(11) The *Prossima* (or lemurs) include, a few species of monkey-like animals from Madagascar and India.

#### THE PRINCIPAL GROUPS OF THE ANIMAL KINGDOM

<b>Protozoa</b> .—One-celled animals of microscopic size.	<b>REINOPODA</b> .—FLAGELLATA. CILIATA. SPOROZOA.	<b>Metazoa</b> .—Cont.	<b>Arthropoda</b> .—Jointed animals with distinct feet and hard external skeleton.	<b>CRUSTACEA</b> .—Trilobites, trilobites (fossil), Phyllopus, fairy shrimp, Copepoda, Ostracoda, Cirripedia, barnacles, Malacostraca, crabs, lobsters, shrimp, beach fleas, sowbugs.
<b>Metazoa</b> .—Many-celled animals.	<b>Porifera</b> .—Sponges.	<b>CALCIPORONIA</b> .—SILICIPORONIA.		<b>ACERATA</b> .—Gigantostoma, horseshoe crabs, Arachnida, spiders, scorpions, mites.
	<b>Coeleenterata</b> .—Corals, jellyfish, etc.	<b>HYDROIDA</b> .—Hydroids, hydroids, jellyfish, Siphonophora, tubular jellyfish.		<b>MALACOPODA</b> .—Foripatus.
		<b>SCYTHOZOA</b> .—Actinopora, sea anemones, corals, Scyphomedusa, larger jellyfish.		<b>INSECTA</b> .—Chilopoda, centipedes, Hexapoda, true insects, Apterygota, bristle tail, spring tails, Pseudoscorpionera, white ants, dragon flies, Orthoptera, locusts, grasshoppers, roaches, Neuroptera, May flies, dobsonas, Coleoptera, beetles, Hymenoptera, bees, wasps, ants, sawflies, Diptera, true flies. Lepidoptera, butterflies, moths. Diplopoda, thousand legs.
		<b>Ctenophora</b> .—Comb-bearing jellyfish.		
<b>Platodes</b> .—Flat worms.		<b>TORRELLARIA</b> .—Nonparasitic Trematoda. Fluke worms, etc.		
		<b>CERATODA</b> .—Tapeworms, NEMATINI.		
<b>Rotalia</b> .—Coelenterates.—Worms with body cavity.		<b>ROTIFERA</b> .—Wheel animalcules.	<b>Chordata</b> .	<b>Leptocardia</b> .—Lanceolates.
		<b>NEMATODA</b> .—Round worms.		<b>Tunicata</b> .—Sea squirts, sea peaches, etc.
		<b>ANNELIDA</b> .—Jointed worms, earthworms, etc.		<b>NAUPEUSTIA</b> .—Worm's tongue, worm's vertebrae, backbone animals.
		<b>MOLYDIA</b> .—Moss animals.		<b>Ichthyopsida</b> .
		<b>BRACHIOPODA</b> .—Lamp shells.		
<b>Echinodermata</b> .—Starfish, sea urchins, etc.		<b>ARTERIOIDA</b> .—Starfish.		<b>CYCLOSTOMATA</b> .—Lampreys, hagfish.
		<b>OPHIOUROIDA</b> .—Brittle stars.		<b>FISCHIA</b> .—Fishes. Elasmobranchii, sharks, skates. Ganadoi, sturgeons, garpike. Teleostei, ordinary fishes. Dipnoi, lung fishes. Amphibia. Urodela, newts, salamanders.
		<b>ECINUROIDA</b> .—Sea urchins.		<b>Amniota</b> .
		<b>HOLOTHUROIDA</b> .—Sea cucumbers.		<b>SACROPOIDA</b> .—Reptilia, snakes, lizards, turtles, alligators.
<b>Mollusca</b> .—Mollusks, usually with a calcareous shell.		<b>AMPHINEURA</b> .—Chitons.		<b>Aves, birds.</b>
		<b>ACEPHALA</b> .—Bivalve mollusks, clams, oysters.		
		<b>SCYTHOPODA</b> .—Tooth shells.		
		<b>GASTROPODA</b> .—Univalve mollusks, snails.		
		<b>CEPHALOPODA</b> .—Squid, cuttlefish.		
			<b>Mammalia</b> .	<b>Mammals</b> .



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1 Blue and Red Macaw.  
2 Incomparable Bird of Paradise.  
3 Golden Bird of Paradise.

4 Resident Trogon.  
5 King Bird of Paradise.  
6 Fire Weaver.

7 Paradise Flycatcher.  
8 Broad Billed Woodpecker.  
9 Marsh Hawk.

10 Bald Eagle.  
11 Barred Owl.  
12 Golden Pheasant.

## DICTIONARY OF ANIMALS

**Arm-tank.**—The *Oryctopus capensis*, an insect-eating animal which perforates of the nature both of the ant-eater and the armadillo; agreeing with the former in its general habits, but, although extremely destitute of scaly armor, more resembling the latter as to its anatomical structure. It resembles about the size of a mole, and has a thin skin is short, coarse, and covered with stiff hair; limbs thick, thick, and very muscular. This animal is very common in South Africa, and has received its popular name from its habit of burrowing beneath its super head and powerful claws excavating its passages, as well as from its fancied resemblance to a small pig.

**Aard-wolf.**—The *Proteles b. inandensis*, a singular carnivorous animal. It forms the connecting link between three genera widely separated from each other, having externally the appearance and bone-structure of the hyena united to the head and part of the body of the wolf. It is the cleverest and most sagacious of all the animals of the country, and is a sort of king about that of a full-grown fox, which it resembles in both its habits and manners, being nocturnal, and constructing a subterraneous abode.

**Ahon-hannes.**—An African bird, considered by some naturalists to be identical with the ancient *Phoeniceus*, but which is now generally held to be a distinct species. It is a very common bird, and is sometimes seen in small bands of from six to ten, and is capable of a lofty and powerful flight.

**Acanthurus** (or surgeon-fish), chiefly distinguished by the sharp and lancet-like spines with which it is armed on each side of the tail. They abound in the tropical seas, where they are generally seen in large shoals of two or three hundred each, swimming with great strength, and feeding principally on different kinds of seaweed. The genus contains a large number of species, many of which are extremely beautiful, both in form and color.

As extremely beautiful, both in form and color, the viper is rightly feared, but is widely distributed throughout Europe, the only British venomous snake. It attains a length of over two feet, brown, with a black zigzag line down the back, feeds chiefly upon mice, and is viviparous. Its bite rarely proves fatal, unless to very weak persons and children. In the United States the term is applied to some poisonous snakes without rattles, as the moccasin, or "water-adder," and the copperhead, or "red adder," and also to the harmless hogsnake, which resembles in appearance and thus the defensive attitude of a viper when threatened.

**Aguara** (or crab-eater).—A carnivorous animal, allied to the raccoons, a native of South America. It equals in size an ordinary fox, to which it bears a slight external resemblance. It derives its name of crab-eater from its habit of feeding on all kinds of crustacea and mollusks, whether marine or terrestrial.

**Agouti.**—A South American animal belonging to the *Rodentia*. The agoutis live for the most part upon the surface of the ground, not climbing nor digging to any depth; and they commonly sit upon their haunches, when at rest, holding their food between their forepaws, in the manner of squirrels. By eating the roots of the sugar-cane, they are often the cause of great injury to the planters.

**ALBATROSS.** A genus of birds of the family *Procellariidae*. The species are the largest of all aquatic birds, the wings, when extended, measuring some times fifteen feet, and weight often exceeding twenty pounds. The plumage is white, with some brown bands on the wings and back. It has a strong, hard, long beak, of a pale-yellow color; the feet, flesh-colored, are short and webbed, and the wings are long, strong, and narrow. It preys on the wing and on the water, and is especially common and usually met with in the Southern ocean, and are also seen in immense flocks about Behring strait in the early part of summer, attracted thither by the walrus and seals, which they follow and follow. Their powers of flight are prodigious.

**Alligator.**—A genus of very formidable and ferocious reptiles, found in the tropical regions of America, and closely resembling the crocodile. They differ from the true crocodiles in having a shorter and flatter head, cavities or pits in the upper jaw, into which the long canine teeth of the under jaw fit, and feet much less webbed. Their habits are less perfectly aquatic. The largest grows to the length of seventeen or eighteen feet. The female lays her eggs in the sand, to be hatched by the heat of the sun.

**Alpaca.**—The *Peruvian sheep*, a variety of the guanaco or llama. It inhabits the more elevated parts of the mountain ranges, living almost on the border of perpetual snow. The Peruvians keep vast flocks of them for the sake of the silky luster and fineness of their wool, which furnishes material for the best of fabrics.

**Macranda.**—The popular name of two of the largest species of the aspidel tribe, viz., a Ceylonese species of the genus *Python* *tigris*, said to have been met with thirty-three feet long; and *Eunectes murina*, a native of tropical America, allied to the boa-constrictor, and the largest of the serpent tribe, attaining the length of forty feet. They frequent swamps and rivers, are destitute of poison fangs, and kill their victims by constriction.

**Anas.**—A genus of birds of the subfamily *Anatinae*, distinguished by a bill broad, depressed, larger than the head, and a pointed tail. The common wild duck or mallard. *Anas boschas* is the original

stock of our tame or domesticated duck. The stock of the wild duck is highly esteemed as an article of food. The widgeon (*Marca penelope*), a species of the same genus, is a migratory bird, bred in the morasses of the north, which they quit on the approach of winter, spreading themselves along the shores, and over the marshes and inlets in various parts of the United States. They are easily domesticated in places where there is plenty of water, and are much admired for their beauty and suppleness.

**Anchovy.**—The *Engraulis encrasicolus*, a well-known small fish of the herring family, abounding in many parts of the Mediterranean, particularly on the coasts of Italy, Greece, Spain, and France. It is about four inches long, of a bluish-brown color on the back, and silvery-white on the belly. They were known to the ancients, and were used both by the Greeks and Romans as a pickle or sauce under the name of *carum*.

the most important of all the varieties of the goat, the *Capra montanus* of the Himalayas. Minor, unsuitable for producing not only a peculiar race of goats, but also sheep, cattle, rabbits, and other animals. The goat of the Himalayas of Angora is generally of a beautiful milk-white color, short-legged, with black, spreading spirally-arranged horns, and a long, shaggy tail. Its distinguishing excellence, however, is the wool, which covers the whole body in long pendulous locks, which are combed out and made into yarn. That the finest camels are made. To the same genus belong the *Camelus bactrianus* and *Camelus ferus*; the latter is descended from the goat of Tibet, which pastures on the Himalaya. It is now domesticated in Persia, and has a long neck and long, fine, silky wool. These goats are now acclimated in the United States, both pure and crossed with the American goat. It was predicted, it is found that in some parts of the country even the American goat is improved by crossing with the evident signs of improvement resulting from the

shagreened, and the name of hymenopterous (or membranous-winged) insects of various genera of the family *Formicidae*, found in most temperate regions, and in some of the tropics, among the most useful insects, and have long been noted for their remarkable intelligence and interesting habits. In the laws, each member of the society bearing a well-defined and separate part in the life of the community. Each consists of males and females, the males being much larger than the males; and of barren females, the workers, which are the most numerous. The neuters are wingless, and the males and females only acquire wings for their "nuptial flight," after which they die. The males and females are able to escape the pursuit of their numerous enemies by divesting themselves of their wings, and either return to their old colonies, or migrate to form new ones. The neuters perform all the labors of the ant-hill or abode of the community; they are the soldiers, the carriers of food, the nurses of the larvæ or young ants, which are destitute of organs of locomotion. We find, therefore, they carefully carry their young to the surface, and deposit them in the sand's nest, and as attentively carry them to a new nest, when the old one is abandoned. The neuters of the ant-hill is distinguished in like manner they watch over the safety of the nymphs, or pupæ, and the young adults, and protect them from all enemies. The neuters possess a special type of neuters, known as "soldiers," from the duties that specially require them. They are larger than the workers, and have powerful jaws. There is a very considerable variety in

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order *Hemiptera*. The ant-eaters have no stingers, have the body covered with rather long hair, an elongated slender head, with very long exertible tongue, and walk on the sides of their feet with the claws. The *Myrmecophaga jubata*, is a native of Brazil and Guiana, and is much the largest of all the ant-eaters. It is covered with long black hair, and is capable of remarkably large tail, with which, when at repose, it can wrap itself up so as to be effectually protected from heat or rain. It is a powerful animal, and is capable of tearing open the hide of a dead animal more than eight feet in length from the extremity of the nose to the end of the tail. It lives exclusively on ants, and is able to tear open the hard shells by tearing open their hills with its hooked claws, and then drawing its long tongue, which is covered with glutinous saliva, over the swarms which flow out.

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**Ant-Bees.** The most remarkable of the old world wasps is the ant-bee, *Myrmecodia formicivorus*, which in its perfect state greatly resembles a dragon-fly; curious on account of its ingenious method of catching the insects—chiefly ants—on which it feeds. It digs a funnel-shaped hole in the driest and finest sand it can find, and when the pit is deep enough, and the sides are quite smooth and sloping, it buries itself at the bottom with only its formidable mandibles projecting, and waits till some luckless insect stumbles over the edge, when it is immediately seized and jerked out, and the head body jerked out. It inhabits southern Europe.

**Argonaut.**—A molluscan animal of the genus *Argonauta*, but not the argo-oid cuttlefishes, distinguished by the females possessing a single-chambered external shell not organically connected with the mantle, and by the males having no shell and are of much smaller size than the females. The shell is fragile, translucent, and boat-like in shape, it serves as the receptacle for the ovum or eggs. The mantle is attached to it with the respiratory tube or "funnel" turned down the carina or "keel." This famed mollusk swims by the aid of the mantle, and in the manner it can crawl in a reversed position, carrying its shell over its back like a snail. The argonaut, or paper nautilus, is not a nautilus, but a mollusk from the *pearly-nautilus* or *nautilus* proper.

*Argus phasianus* (*Argus gigantus*).—A large, beautiful, and very singular species of pheasant, found in the mountains of Assam, and especially in Sumatra and some of the other islands. The males measure from five to six feet from the tip of the beak to the extremity of the tail, which has two greatly elongated central feathers. The plumage is exceedingly beautiful, the secondary quills of the wings, which are longer than the primary feathers, being each adorned with a series of ocellated or eye-like spots of brilliant metallic hues. The general body plumage is brown.

**Armadillo** (genus *Dasypus*).—A mammal peculiar to South America, consisting of various species, belonging to a family intermediate between the sloths and ant-eaters. They are covered with a hard bony armor, the plates of which are joined by separate plates like a coat of mail, flexible everywhere except on the forehead, shoulders, and haunches, where it is not movable. The belts are connected by a series of rings, which enable the animal to roll itself up like a hedgehog. These animals burrow in the earth, where they lie during the daytime, seldom going abroad except at night. *Dasypus virgatus*, being three feet in length without the tail, and the smallest only ten inches. They subsist chiefly on fruits and roots, sometimes on insects also. They are very inoffensive, and their flesh is esteemed good food.

**Asp** (*Apsa*, or *Vipera*, *Aaje*).—A species of viper found in Egypt, resembling the cobra de capello, or spectacle-serpent, of the East Indies, and having



than the other pairs, and present on the exterior a triangular depression, resembling a *palette*, in which is secreted the pollen. The borders of a sort of basket in which the insect deposits the pollen of flowers. To each of these legs is attached a small, pointed process, which might be termed the ankle, smooth on the exterior, but having hairs on its interior surface which are caused to rise in the manner of a comb, and which is employed in collecting the pollen. The other tools of the working bee consist of a pair of movable mandibles, which have two teeth on its two sides, and of a trunk, or proboscis, which may be considered as a sort of tongue; this organ has a leathery surface, whereas the honey of flowers adheres, whereas it is conveyed to the mouth, and from it to the stomach, to be subsequently digested. The mandibles are much larger and more hairy than the working bees; they emit a buzzing sound, have a longer body than the workers, and the wings shorter in proportion. The only part she has to play is that of laying eggs, and so she has no palates or brushes. Only one queen lives in each hive, of which she is perfect sovereign, all the workers submissively obeying her. The number of males is scarcely one-tenth that of the working bees, and they live only about three months. The was of which the cells of the honeycomb are constructed is supposed to be secreted by an organ situated in the abdomen, but it is not the case. The secretion was, another substance, much resembling it, but not identical, called *propolis*, is elaborated by the juices of certain plants, and is used to line the inner surface of the hive. The cells are hexagonal in shape, that is, having six equal sides; the most common cells are of two kinds, and are of two kinds, namely, store-cells, which are filled with honey, as a reserve store of food, and middle-cells, in which the eggs are deposited. At a certain time of the year the queen leaves the hive, accompanied by the drones, and takes what is called her nuptial flight. After this flight. About forty-eight hours after her return to the hive she begins laying her eggs, at the rate of about one hundred a day. The eggs which are destined to develop into workers are first laid, then those which are to produce males, and lastly those which are laid to females. The eggs which are long in being hatched, and the *larvæ*, or caterpillars, which emerge from them are tended by the workers, and fed by them on a mixture of honey and apparently a preparation of pollen. In five or six days the larvæ pass into the condition of pupæ, and in twelve or thirteen days they are hatched, and this the perfect insect is hatched.

**Beetle.**—A name often used as synonymous with *insect*. Coleridge, but it is not the case. Others to include all those insects that have their wings protected by hard cases or sheaths called elytra, and they are very numerous. The beetle of a man's fist, the largest, the elephant beetle of South America, and a whole series of night beetles, and a whole series of kitchen and cellar are not properly beetles at all, but cockroaches, and so on.

**Bird-catching spider.**—A name applied to gigantic spiders of the genera *Mysale* and *Epeira*, more especially to the *Mysale araneus*, a native of Surinam and elsewhere, which preys upon insects and small birds, which it hunts for and pounces on. It is about two inches long, very hairy, and almost black; its feet when spread out occupy a surface of nearly a foot in diameter.

**Bird of paradise.**—The name for members of a family of birds of splendid plumage allied to the crows, inhabiting New Guinea and the adjacent islands. The family includes eleven or twelve genera and a number of species, some of their remarkably beautiful. The largest species is the bird of two feet in length. The most beautiful (Paradisea regia) is possibly the most beautiful species, but is rare. It has a magnificent plumage of blue, white, and delicate iridescent tints. It feeds from under the wings, and falling over the back like a jet of water. The feathers of the *Paradisea regia* and *Paradisea* have the most beautiful plumage. These splendid ornaments are confined to the male bird.

**Bison.**—The name applied to two species of ox. One (the European bison, or aurochs, *Bos bison* or *Bison europæus*), is now nearly extinct, being found only in the forests of Lithuania and the Caucasus. The other, American bison, (improperly termed buffalo (*Bison americanus*), is found only in the region lying north and south between the Great Salt Lake and the Yellowstone river, and is rapidly becoming extinct. The wild state, to which it is confined, is an immense herd. The two species closely resemble each other, the American bison, however, being more numerous, and the European bison is weaker and blind-quarer. The bison is remarkable for the great bump or projection over its forehead, which is covered with hair, and is about six feet in height; and for the long, shaggy rust-colored hair over the head, neck, and forepart of the body. The skin of the bison is shaggy and backward, the surface is covered with a very short fine hair, smooth and soft as velvet. The tail is short and tufted, the feet are small, and the bison used to be much hunted for sport as well as for its flesh and skin. Its flesh is rather coarse

grained than that of the domestic ox, but was considered by hunters and travelers as superior in flavor. The bison is a very hardy animal, celebrated for its richness and delicacy. Their skins, especially that of the cow, dressed in the manner of the bison, are used for making defenses against the cold, and are known as buffalo robes; the wool has been manufactured into hats, and the skin into boots. The American bison is found to breed readily with the common ox, the issue being fertile among themselves.

**Butterfly.**—The name of several insect birds, family *Asteria* or *herona*, genus *Butterfly*. There are two British species, the common *Butterfly* (*Herona*), and the little *Butterfly* (*Herona minuta*), a native of the south, and only a summer visitor. British *Butterflies* are distinguished from the reclamation of the marshy grounds that form their favorite haunt. The common *Butterfly* is about two-and-a-half inches in length, about forty-four in extent of wing; general color, dull yellowish-brown, with spots and bars of black or dark brown; feathers on the breast long and loose; tail short; bill about four inches long. It is remarkable for its curious booming or growling sound, which varies the notes of the *Butterfly* and *Butter-bug*, etc. The eggs (greenish-brown) are four or five in number. The little *Butterfly* is not more than fifteen inches in length. The American bison (*Butterfly lentiginosa*) has some resemblance to the common European *Butterfly*.

**Blackbird** (*Turdus merula*), called also the *merle*, a well-known species of thrush, common in Britain and throughout Europe. It is larger than the *Merle* in its length, and its bill is about four inches. The color of the male is a uniform deep black, the bill being an orange-yellow; the female is of a brownish black, with black on the head, neck is usually in a thick bush, and is built of grass, roots, twigs, etc., strengthened with clay. The eggs are four or five in number, and are greenish-blue, spotted with various shades of brown. The song is rich, sweet, and melodious, but of no great variety or complexity. Its food is worms, snails, fruits, etc. The blackbirds, or crows, of North America are quite different from the European blackbirds, and are nearly allied to the starlings and crows. The red-winged blackbird, which is common in America, is the starting family, is a familiar American bird that congregates in great flocks.

**Bloodhound.**—A variety of dog with long, smooth hair, and a keen, ravenous, and much esteemed for its smell, and employed to recover game or prey which has escaped wounded from the hunter. It is a large, powerful animal, with a black and white spinal; whence the name of the dog. There are several varieties of this animal, as the English, and the French, and the American. The former times bloodhounds were not only trained to the pursuit of game, but also to the chase of fugitive slaves. The American bloodhound is a hunting fugitive slave.

**Bluebird.**—A small, dainty, insectivorous bird, of the family *Sialia*, which is common in the United States. The upper part of the body is blue, and the throat and breast of a dirty red. It makes its nest in the hole of a tree, or in the hole of a rock, and is commonly provided for its use by the friendly farmer. The bluebird is the harbinger of spring to the Americans; its note is cheerful, continuing with little interruption from March to October, but is most frequently heard in the warm days of the spring. Its song is also called *blue bird* or *blue robin*, and is regarded with much poetical sentiment as the harbinger of spring.

**Bluefish** (*Pomatomus* or *Pomatomus salator*).—A fish common on the eastern coasts of America, allied to the mackerel, but larger, growing to the length of three or four feet, and weighing from ten to twenty pounds for the table. It is very destructive to other fishes. It is also called horse-mackerel, green-back, etc.

**Boa.**—A genus of serpents, family *Boide*, having the jaws so constructed that these animals can bite and crush with sufficient force to swallow the animal whole. The bores are peculiar to the hot parts of South America. The *boa constrictor* is the largest, and the largest specimen of the genus exceeding twenty feet in length; but the name *boa* or *boa constrictor* is often given popularly to the large serpents of the tropics, and so as to include the pythons of the old world and the anacondas and other large serpents of the tropics.

**Bony pike** (or garfish).—A remarkable genus of fishes inhabiting North American lakes and rivers, and is the few living species of the order *Ganoid*, the order of ganoid fishes so largely developed in previous geological epochs. The body is covered with bony scales, and the scales are so thick that it is impossible to pierce them with a spear. The common garfish attains a length of five

feet, and is easily distinguished by the great length of its jaws.

**Bower bird.**—Certain birds of Australia and New Guinea which have the habit of building bowers. These are constructed on the ground, usually in some retired spot, and are formed of twigs, hanging branches, and are decorated with feathers, shells, stones, bones, etc. The bowers are not built by the male, but are ready-made at the mating season.

**Buffalo.**—The name of a certain wild cattle of the warmer parts of the old world, living in marshy places. Some of them have been domesticated and are used for carrying loads, and for other purposes. They were first introduced into North America, a very different kind of animal. When first introduced into North America, they were used as Ohio, while farther west they occurred in enormous herds. With the opening of the transcontinental railroads, they were nearly exterminated, so that now there are only a few protected herds. The attempt has been made, with some success, of crossing them with domestic cattle.

**Bug.**—A name loosely applied to any insect, but strictly belonging to insects of the order *Hemiptera*, which have sucking mouthparts and the wings partly hardened, partly membranous. Most of them feed on the juices of plants which they suck by means of the beak, but a few prey upon other animals, the bedbug attacking man. Most of the genus are of no great value, but a few are of value, like the lace insects and the cochineal, the red dye of which is obtained from the cochineal.

**Bulldog.**—A variety of the common dog, remarkable for its short, broad muzzle, and the projection of its lower jaw, which is furnished with sharp teeth to protrude beyond the upper. The head is massive and broad; the lips are thick and pendulous, and the ears are at an extremity. The neck robust and short; the body long and stout; and the legs short and thick. The bulldog is a slow-moving, ferocious animal, better adapted for savage combat than for any purpose requiring activity and intelligence. For this reason he is often used in the chase of the fox, and is also used—as its name implies—for the barbarous sport of bull-baiting. The *bull terrier* was originally from a cross between the bulldog and the terrier. It is smaller than the bulldog, lively, docile, and very courageous.

**Bufo.**—The name of the largest species of frog. It occurs through a large part of the United States and has its name from the loud croak which some of them utter. It is a large, stout animal, with a dusky brown above, yellowish-green beneath, and is spotted with black.

**Bullhead.**—A common name for several species of fish. In the United States the name is given to some species of the order *Acipenser*, and is also applied to a smaller fish, allied to our miller's thumb, but belonging to a different group from the catfish.

**Bustards.**—Birds of the order *Gallina*, restricted to the old world, and somewhat closely related to the quails. The *great bustard* is the largest about the size of a turkey, is the largest bird in Europe, and ranges east to Tartary. The little bustard is common in southern Europe. Other species occur in Asia, Africa and Australia. They are vegetable feeders and all are strong runners, and though they are slow to take wing, they fly well.

**Butterflies.**—A group of insects with broad wings belonging to the order of *Lepidoptera*, which are easily distinguished from the moths by their habit of flying in the daytime and by having the antennæ feelers at the end of the head ending in a club, and never tapering or feathered. Like many other insects these hatch from the egg with the shape of the caterpillar, and are very different from the adult. This is usually the case with the caterpillar, and it is usually passed the winter. Then the chrysalis case splits down the back and from the opening the butterfly comes out. It is at this stage in which it lays the eggs which are to go through the same history. There are several thousand species of butterflies known, the majority being inhabitants of the tropics.

**Bustard.**—A name applied to several diurnal birds of prey formerly denominated the hawks, our common hawk being a bustard. These birds feed on mice, moles, small birds, insects, etc., and on the whole are benefited to agriculture. The common bustard is spread over the whole of Europe and America, and is a very common bird. The bustards are not so numerous as the hawks, and the honey bustards of the old world feed on honey and on the larvae of bees.

**Camel.**—A family of animals which includes a few forms of animals that chew the cud but are without horns. In the warmer parts of the old world are two species of camels, the dromedary and the Arabian camel, which serve as beasts of burden. One, the dromedary, has a single hump of fat, etc., upon the back; the Arabian camel has two humps. There is some exaggeration in the common accounts of their endurance and of their ability to go for a long time without water. The hair of the camel is very coarse. In Persia and adjacent parts of North America are four members of the family, two of

which, the llama and the alpaca, have been domesticated.

**Camelopard.**—See giraffe.

**Canoe shells.**—Certain small shells from the sea, in which the natives of the Pacific employ a thin layer which makes these of value for canoes. The manufacture of these is mostly carried on in Genoa and Naples.

**Canary.**—One of the finches, originally coming from the Canary Islands, but domesticated for three hundred years. In the tropics, the canaries are favorites with many, and the best songsters bring high prices. While the usual color in cage birds is canary yellow, the wild birds are a dull green.

**Canasack duck.**—An American duck, breeding in the far north and shot in summer in the Canadian lakes. In the Chesapeake they feed on the roots of the *Fadiscaria* (wild celery), a marsh plant which gives the flesh a peculiar taste, and makes these the most esteemed of game birds.

**Cardinal bird.**—One of the finches, also known as the redbird. It is a native North American and is a good singer. Its common name is due to the bright red plumage.

**Carp.**—A group of fishes without spines in the fins. The true carp originated in China and was introduced into Europe three hundred years ago, and much later into America. It has little value as a food supply, aside from the fact that it is readily reared in confinement. The carp has numerous varieties, among them the familiar gold and silver fishes. Less known in America are the leather carp, in which the scales have been lost, and the mirror carp, with only a few scales on the head and scales on either side of the body.

**Carpel beetle.**—A small beetle of inconspicuous colors which originates upon flowers, but which has taken to animal food, and especially to woolen goods. It is the larva which does the damage.

**Catbird.**—A well-known species of American thrush, which, during the summer, is found throughout the Middle and New England States. The plumage is a deep slate color above and lighter below, and the nightingale whistling in the song is largely imitative of those of other birds, but it also has the cat-like note which gives it its common name. It is a native North American, the extreme south of the United States, and is found also in Mexico and Central America.

**Catfish.**—A large family of fishes including the lion, tiger, panther, leopard, lynx, puma, and a number of other forms, among them our domestic pussy. All have a family of sharp teeth and sharp teeth and elongate pupils to the eyes. The common cat is probably a native of Egypt. Certain it is that it was domesticated by the Egyptians, and was an object of worship and was frequently mummified. It was not known to the ancient Greeks and Romans, and was taken by the rats and mice being taken by domesticated man. The domestic cats are cleanly animals, never attached to poisonous or noxious food, and many domesticated animals, are very variable in color. Besides the ordinary kinds, there are common the tailless (Manx cats, from the Chinese as well as from the island of Man) and the Angora or Persian cats, with long silky fur. The oon cats are merely a race of the latter. The original of the domestic cat was probably marked with black bar on a ground of tawny and white, these colors rendering them inconspicuous among the grasses and shrubbery where they ranged.

**Catpup.**—A group of jointed animals belonging to the order *Myriapoda*, characterized by having numerous segments to the body, each with a pair of walking feet. The head is very like that of an insect, but the remaining segments of the body are not divided into regions. The legs of the first segment behind the head contain a poison gland, and its secretion is fatal to man and many other insects in length. The bite of these larger forms causes considerable pain, but authenticated cases of death following the bite of a centipede are rare.

**Cephalopoda.**—A group of mollusks in which the mouth is surrounded by a number of arms, each usually bearing a suckling organ. The suckling organs, eyes, a sack enveloping the body, and a shell which may be either external or internal. The group includes the squid, cuttlefish, and nautilus, and many other forms without common names.

**Chameleon.**—A genus of lizards, natives of parts of Asia, Africa, and Europe. The best-known species has a naked body six or seven inches long, with a prehensile tail about five inches long, and is famous for grasping branches. The skin contains small grains of a bluish-gray color in the shade, but in the light of the sun it changes to a brilliant green of a grayish-brown or tawny color. It possesses the curious faculty of changing its color, either in accordance with its environment, or with its temper when disturbed, the change being due to the presence of clear or pigment-bearing contractile cells placed at various depths in the skin, their contractions and dilations being under the influence of the nervous system. Other lizards have the same power of changing color, and the name has been also applied to them. Their power of fasting and habit of inflicting themselves give rise to the fable that they can live for a long time

in reality insectivorous, taking their prey by rapid leaps, and using a long, muscular tongue. In general habit they are dull and torpid.

**Chamois.**—A species of goat-like antelope inhabiting the high mountains of the Alps and the western Asia. Its horns, which are about six or seven inches long, are round, almost smooth, and are straight until they are about half grown, where they suddenly terminate in a hook directed backward and downward. Its hair is brown above and white below, the tail coarse and bushy in spring. The head is pale yellow with a black band from the nose to the ears and surrounding the eyes. The animal is a very sure climber, the nature of its haunts, and its powers of smell, render its pursuit an exceedingly difficult and laborious task for the hunter.

**Chimpanzee.**—The native Guinea name of a large West and Central African ape belonging to the anthropoid or man-like monkeys, and to the same genus as the gorilla. When full grown it is sometimes about five feet high, with black hair, and is not so large and powerful as the gorilla. It walks erect better than most of the apes. It feeds on fruits, often robs the gardens of the natives, and conducts a sort of most amicable warfare. It is common in menageries, where it shows much intelligence and docility.

**Chinchilla.**—A small animal, about nine inches long, occurring on the west slope of the Andes, and hunted for its beautiful fur. The chinchillas are members of the order *Rodentia*.

**Chiton.**—Bivalve mollusks which form a considerable element in the food supply. The name is locally used for the tail of the gull, which is applied to the quahog, with a heavy shell capable of closing completely, and to the long clam, with lighter outer and thicker inner valves. In the latter two long tubes up to the surface, and through these it obtains the food and water necessary for its existence.

**Cochineal.**—A bug allied to the plant lice, which feeds on the leaves of the cochineal cactus, when dried and treated with alum, and the extract is dried, gives the brilliant red dye, carmine.

**Cockroach.**—A member of the order *Blattaria*, some small, others two inches long, which feed upon decaying vegetable matter. Several species have taken to domestic life, and many of them prove most unwelcome boarders. Many methods have been advocated for their extermination, but none has been successful. They are very numerous, and for individual species, and a continuation of this for months.

**Codfish.**—A species of marine fishes with barbels about the mouth and with three lines upon the back and all fins without spines. This is probably the most common food fish of the world, and numbers on the coasts of Europe and of eastern North America. It occurs in the northern Pacific from Alaska down upon the coast of California, and large specimens weigh over one hundred pounds. Allied to the cod are the haddock, the turbot, and the halibut.

**Condor.**—A South American bird, one of the largest of the vultures. It resembles the common vulture, differing from the latter in the form of the carilaginous caruncle which surmounts its beak, and in the large size of its oval and longitudinal nostrils. Despite stories of its gigantic proportions, Humboldt met with no specimens whose wings exceeded nine feet in expanse, though it has been known to expand to fourteen feet. It is found in the Andes chain, frequenting regions from 10,000 to 15,000 feet above the level of the sea. They only descend to the plains under stress of hunger, when they attack sheep, goats, deer, and bullocks. They prefer carrion, however.

**Coney.**—A small animal mentioned in the Bible and supposed to be the *Hyrax* of science. Its home is around the eastern and southern coasts of Africa. The animal is without near relatives.

**Coral.**—The living structure of certain low animals allied to the lime-secreting corals, and grouped by zoologists as *Celesterales*. The coral is secreted by the animals, and is taken up by the skeleton of something of the radiate structure of the animal. As the animals usually form colonies of hundreds or thousands of individuals, each secreting a little cup in which each individual was seated. When the animals die these coral masses are left behind, and the solid structure of the coral reefs and islands are formed by them. The precious coral of the Mediterranean and of Japan is a solid and is taken up by the skeleton of the animal. The value of the coral depends upon the color and size of the piece, the pale pink commanding the highest price. The coral is used in jewelry, and for counterfeits, made of marble, and for dyed coral.

**Crab.**—The common name of a large number of the arthropods, to which the group is allied, and folded under the anterior part of the body—the cephalothorax. Over two thousand species are known, differing so widely in size and in other respects. The great majority are marine, but there are a few which spend their entire life on land, only going to the water once a year to lay their eggs. The largest is the great spider crab of Japan, whose legs may stretch out a dozen feet. Like all arthropods, the crabs molt their skin, and after the molt, their skin is soft. One species on the Atlantic coast is taken at this time in great numbers, and is the favorite soft-shell crab

of the table. The hermit crabs have the abdomen and legs protruding from a shell, and carry this about with them wherever they go.

**Crane.**—A genus of birds, including the largest bird in the world, the ostrich, and the smallest, the quail. The crane is remarkable for its long migrations, in which they usually fly in large flocks led by a single leader. The male and female cranes are monogamous, and the leadership is continually changed. The common crane breeds in the north of Europe and in Siberia, and migrates to the south in the fall of winter. It attains nearly five feet in height; with the exception of the neck, which is black, the body is uniformly gray. It is a very strong swimmer, and it frequents large plains and marshes, and feeds on fish, reptiles, frogs, mollusks, worms, leeches, and even small mammals. It is very tame, and the birds pair for reproduction and rearing the young. The games and dances in which they indulge are noteworthy. They form groups in various fashions, advance toward one another, make a kind of salutation, and adopt postures of various kinds. In some species occur in America, the whooping crane being noticeable for the convulsions of the trachea within the throat.

**Crayfish.**—The common name of the small crustaceans of fresh water which resemble the lobsters in appearance. They usually live in burrows in the banks or bottoms of streams and feed on decaying animal matter. In Europe they form a considerable element in the food supply, and are found in ponds. A large number of species occur in the United States, and in the larger markets they are sold by the dozen.

**Crocodile.**—A genus, family, and order comprising the largest living reptiles. The characters of the crocodile are the following: The body is covered with square, bony plates; the tail is long and compressed. The feet are short, and there are five on each side. The head is broad, and the jaws are the latter more or less webbed. The jaws are long and the teeth are small. The nostrils are at the extremity of the snout, and are capable of being closed to prevent ingress of water. The heart is four-chambered, and the blood is red. The crocodile is the alligator, crocodile, and gharial. The alligators are all new world forms. The gharial proper is found in the Indian Archipelago. The crocodile of the Nile is the best-known member of the order; another species is met with in southern Europe, and the crocodile of the Nile is the largest. The crocodile is formidable from its great size and strength. It is exclusively carnivorous, and always preys upon the weak and the sick. It is found in Egypt it is no longer found except in the upper or more southern parts. It grows sometimes to a length of thirty feet, and apparently lives to a vast age.

**Crow.**—The family, widely diffused over the world, including the raven, the jay, and the magpie. The common crow of North America is remarkable for its intelligence and cunning. It is very wary, as well as for its intelligence and cunning. They pair in March; the male repairs their nests, the female builds them. They are very thieves that while the one is fetching materials the other must keep watch to prevent the rising birds from being plundered by their neighbors. As soon as the nest is finished and the eggs produced (five, bluish-green, with dark blotches), the male takes upon himself the care of providing for his mate, which he continues during the whole period of incubation. They frequent the same rookeries for years, but allow no intruders into their community. They feed chiefly on worms and the larvae of insects; they also eat grain and seeds, whence they have sometimes been supposed injurious to the farmer; but they simply repay him for what they take by destroying the vermin in his fields.

**Crustacea.**—One of the great groups of animals, including the lobster, crab, barnacle, shrimp, etc. They are characterized by having two pairs of feelers (antennae) at the front of the head, and by a skeleton by gills attached to some of the legs, and a laborious nervous system. As they have a hard, chitinous covering, they are able to live in water in size by shedding the external skin at irregular intervals. Several thousand species are known.

**Cuttlefish.**—A member of the order *Cephalopoda*, the class of *Cephalopoda*, in which there are ten arms around the mouth. The internal shell is calcified, and is called the cuttlebone. It is a very common bird. They have also an ink bag, the secretion of which furnishes the pigment sepia. Cuttlefish is an important article of food in southern Europe.

**Deer.**—A group of ruminant quadrupeds constituting the order *Ruminantia*, and including the reindeer, combining much compactness and strength with slenderness of limb and fleetness. They use their horns for defense, but are not so much as in general they trust to flight for their safety. They have a long neck, a small head, which they carry on a long neck, and large, full eyes. They have acute glands, usually beneath the eyes, which serve as sexual attractions. Deer are divided into two groups, the antelope and the branching horns (antlers), which in most species exist in the male only; they are solid, fall off annually, and are renewed with increase of age.

and number of branches, according to the kind, and said the animal had reached old age. Deer are found in almost all parts of the globe, except Australia and the south of Africa, their place in the latter region being supplied by antelope; the greater number inhabit the warmer temperate countries, and they are chiefly found in wide plains and hills of moderate height. The flesh (venison) of most kinds of deer is highly esteemed for the table, and they have long been regarded as among the noblest objects of the chase. Only one species, the reindeer, can be said to have been fully domesticated.

the large, lightless pigeon formerly living in the Mascarene islands in the Indian Ocean. It was a large bird, and the last individual disappeared before 1700. "An animal well known for its attachment to its young," says the author, "it was of various varieties, as to size, form, color, and quality of its food." The author is not sure whether it belongs to the order of *carnivorous mammals*, and to that section distinguished as *edentate*, or to the order of *birds*, and to that section called *procellariæ*. It is a question of considerable interest what was the parent stock of the dog. "The dog is a domestic animal derived from the wolf; others think that it is a domesticated animal derived from the jackal, and that the jackal is in a primitive state of nature. That there are wild dogs, we know. The tribe of India and the dog of the East are the same, and are in a state of complete independence, and throw no light upon the question. The dog will live on cooked vegetables, and will eat the refuse of the kitchen, and it lags with the tongue." It never perspires, and it has no sweat glands. "The dog is a creature that hangs out of the mouth. The female goes with young sixty-three days, and usually produces six or seven puppies. The puppies are blind at birth, and do not acquire their sight until the tenth day. The dog attains its full size at the age of six months, and lives to be a old at fifteen, and seldom lives beyond twenty years."

**Dormouse.**—Small animals, in some respects intermediate between the squirrels and the true mice. They live in the trees of Europe, but in their hibernations they become so torpid that "he sleeps like a dormouse" is proverbial.

doves.—A name for several of the more familiar pigeons, like the mourning doves of the United States and the turtle doves of the old world.

**Dragon Fly.**—One of the insects of the order *Pseudoneuroptera*, which has an elongate body and long and slender wings. They lay their eggs in the water, where the young are hatched and feed upon all kinds of aquatic insects. The adults

**Duckbill.**—A peculiar mammal of Australia, living in the streams, and feeding, like a duck, on the matter contained in the ooze at the bottom. In accordance with these habits the toothless jaws are prolonged into a duck-like beak and the feet are webbed. The animal has many other peculiarities of structure, among them the presence of but a single opening (as in reptiles and birds) for the digestive and urogenital organs. It also does not bring forth living young, like all other mammals, but it lays eggs. It is about 6 feet

**Ducks.**—A group of swimming birds, too well known to need description. Most of the species are migratory and some, like the mallard and the shoveler duck, are found in both the old and the new worlds. Among the interesting forms are the eiders, well-known from their soft down. They are found in the colder parts of both continents. The Labrador duck was formerly very abundant, but is now probably extinct. Specimens are far rarer in museums than of the great auk. The wood duck is possibly the most beau-

bird species. The group of birds belonging to the order *Falconiformes* and to the same family as the falcons are the hawks. They are found in all parts of the globe. The size varies according to the species, but all attain imposing dimensions. The golden eagle measures about three feet nine inches in length, and the spread of its wings is nearly ten feet. It is the largest of its kind, and its power of vision is very acute. It builds its nests in the crevices of inaccessible rocks, and lays generally two or three eggs; the period of incubation is thirty days. Besides the golden eagle, there are other species, such as the American eagle, the bald eagle, the tawny eagle, the booted eagle, and numerous smaller species in tropical regions.

**Earthworms.**—A group of burrowing worms, found in the earth in almost all parts of the world. They are without eyes or well developed appendages. They live on the organic matter in the soil, and to obtain this they swallow the earth through which they move, and cast the refuse on the surface. This makes them of great value to the agriculturist, as they work over and loosen the soil. In the winter they burrow down beneath the frost, and the large numbers frequently seen after a storm is not due to their having descended with the rain, but to their having been drowned out of the earth.

**Echinodermata.**—A great group of animals with a radiate structure, and with a spiny skin. They

are all marine. The class includes the starfish, sea urchins, sea lilies, and some other less commonly known forms.

**Edentates.**—A group of mammals in which the teeth are not always lacking, as the name would imply, but in which they are imperfectly developed. The group is largely American and includes the armadillos, sloths and anteaters.

**eels.**—Fishes of very elongate form, living in the sea. There are several species belonging in very different groups. The lamprey eels have no true jaws, no limbs, and a large number of gill openings. They ascend the rivers in the spring to deposit their eggs, while the true eels descend from the rivers in the fall to the sea for the purposes of reproduction.

[illegible]

Alceen.—A male of various birds of prey, member of the family Falconidae. The falcons proper are the *Falco* group, and the falcon is the most perfectly developed of the feathered race. They are distinguished by having the beak curved and the mandible with a notch or tooth on its cutting edge on either side, wings long and powerful, the second feather rather the longest, and short tail. Among the birds of prey, the falcons are the peregrine falcon and the gyrfalcon. These were the principal birds used in falconry during the Middle Ages, and were especially valued in the East. At one time the sport was almost solely the nobility. Falcons were carefully trained, and were immediately set upon any other game that might be in sight. The pleasure was in watching the falcon getting the better of birds, sometimes many.

fishes.—The lowest class of vertebrate or backboneed animals. They are adapted for an aquatic life, and are able to move with rapid progress through the water. They breathe by means of gills, and are divided into the sea and the fresh water species. The sex, and their appendages (fins) are such as to make efficient paddles. There are usually two pairs of fins, the dorsal and the ventral, and one or two in a corresponding position beneath the dorsal. The tail is usually terminated by a caudal fin, the chief organ of swimming. The caudal fin presents two different forms, the diploid and the teleost. In the teleost the caudal fin is straight at the tip, and the lobes on each side are of equal length. In the diploid the fin is in the horizontal tail the backbone is turned upward at the tip, this making one lobe, while the other is divided into two. This is the type of tail in the shark. The teleost form is the most common of the two, but the last, but the two lobes are equal. Most fishes have the latter type. All of the fins are of cartilage or bone, and are of various shapes in character. There are but two chambers to the heart, and the occurrence of a ventral fin is a character of the teleost. The depth of the water in which the fish is, is very often indicated by the position of the dorsal fin, and the position of the fish, distinguished by the presence of a cartilage or a bony skeleton, by having the gills situated in the mouth, by the position of the dorsal fin, by the skull, presence or absence of air bladder, and by the position of the pectoral fins.

**Flamingo.**—A genus of web-footed birds, in some respects intermediate between the storks and

the ducks, their long legs and necks giving them a resemblance to the former, while their webbed feet connect them with the latter. Their food consists of aquatic vegetation. They are said to appear to be mollusk-eaters, but were found with insects, etc. They breed in companies in mud flats or inundated marshes, raising up the mud into high hills, and then sitting on the eggs so as to form a nest. In this hollow the female lays her eggs and hatches them by sitting on the eggs. The young are hatched in the mud. The young, which never exceed three in number, do not fly till they have nearly attained their full growth, though they can run very swiftly and swim. This species is common in the Southern States, but the common American species is deep red with black bills. It is peculiar to tropical America, migrating southward to the Southern, and rarely to the Middle States.

**Flea.**—A group of wingless insects, mostly parasitic on other animals. They have a hard skin, covered with spines so arranged that they can easily move themselves through the hair, legs admirably adapted for jumping, and the mouthparts fitted for sucking blood. They are everywhere, and are found in cracks in floor or some similar place where there is dirt, and when they are mature they attack all animals. The irritation and annoyance of the bites are sufficient to make them a nuisance, but now it is known that they are an important agent in the transmission of certain diseases, bubonic plague being communicated to man by the black rat flea.

**Flatfishes.**—A group of fishes, including the halibut, sole, turbot, flounder, etc., in which the extremely flattened body has undergone a strange modification, both of the eyes of the adult being on the same side of the head. In correlation with this the fishes live on the bottom of the ocean with the eyed side uppermost, waiting for their prey. The lower, eyeside, side is white, the other colored similarly to the bottom.

flies.—A term applied to various insect different groups, but strictly belonging to the two-winged insects, the *Diptera* of science. Besides the sun-burner, or house fly, which is the most common, there is a metamorphosis, and by its sucking mouthparts. There are some thirty or forty thousand species of flies, of which we will not discuss the habits of the individuals as such. Some species are closely connected with man, and of these the common house fly is especially noticeable. This lays its eggs in manure, and the young fly passes through all its stages and emerging as perfect insects in a few days. Their unclean habits make the house fly more efficient agent in the transmission of disease than any other insect in the typhoid fever and others which attack the digestive tract. Flies are therefore not merely a nuisance, but they may be depicted as the most pestiferous of mankind. Among other flies are the carrion flies, black flies, the gnats and the mosquitoes, which all trouble to man while others attack the animals.

**Flounder.**—One group of flatfishes of moderate size, common near the shore. They are held in moderate esteem as food fishes.

**Flying-fish.**—A name common to various fish which have the power of sustaining themselves for a time in the air by means of their large pectoral fins. Generally, however, the name is limited to the species of the genus *Xerocetus* which belongs to the family *Scomberesocidae* (mackerel-pikes). These can pass through the air to a considerable distance, sometimes as much as 200 yards, to escape from the attacks of other fishes, especially the dolphin. They are most

**Flying-squirrel.**—A genus of rodents, family *Sciuridae* (squirrels), which, by means of the skin of the flank, extending between the fore and hind legs can support themselves for a moment in the air as with a parachute, thus making great leaps. The American flying-squirrel lives in the northern parts of North America.

**Fox.**—Carnivorous animals of which there are several species, belonging to the same family as the dog, and distinguished by their long and long bushy tail; as well as by its cunning, which is perhaps the most remarkable quality of the animal, and is elongated, and not circular as in the dog, the ears are triangular and pointed. A very singular circumstance is, that the animal has no root of the tail; this odor is so fetid that even other animals avoid its locality. The common fox is found in the interior of North America, and extends also into Northern Asia. Its senses are extremely acute. It usually remains concealed in its hole, and only comes forth during hours abroad chiefly at night, in search of food. Birds, rabbits, or hares constitute its usual prey, but it is not confined to these alone, and is wont to rob other food, and has a predilection for certain fruits. It is very destructive to the sheep, and is destructive. Though slightly tame, the fox has great muscular vigor, and bites with much severity. It is not so much tamed as the dog, and is not properly domesticated; and adults, when placed in confinement, show great ferocity, and would destroy their young. It is very cunning, and as well as the cunning which dictates various expedients for escape, makes the chase of the animal very difficult.







common name is due to its gelatinous consistency. Most of the species start in life as buds from attached animals, while later separate and become freed from the animal by opening and closing the bell. The jellyfish are the sexual animals, producing the eggs from which the fixed polyps arise. Most of the species have a practical value; they have stinging organs which are used for defense and to kill their prey. In some the strong current is used to draw food to man. A general name for the group is *Medusae*, while the fixed stages are called polyps.

**Kangaroo.**—A name applied to marsupial animals. They are the most highly developed members of the order, and occur in Australia. Outside the place of origin, the kangaroos comprise over fifty species, and of these the great kangaroo may be taken as a type. This species is formerly placed in the order of marsupials, is now retiring before the colonist. The females are small, the hind-limbs very large and thick; the head small with rather long ears, and a long, dusky-brown mane; the body long, with the fur shortish but thick, and of a gray-brown tint. In height it is as tall or taller than a man. The female carries her young in a pouch on the underside of the belly. When moving quickly the hind-limbs alone are brought into action, and by means of these the animal bounds along in leaps of from three to four feet. It is usually being carried in a nearly horizontal position, and the tail extended to balance it. The fore-limbs are chiefly used in pushing and pulling, and the females lift their young, and place them in the pouch. The kangaroos are vegetable feeders.

**Lamprey eels.**—Eel-shaped animals of a very low form, mostly living in the sea, and sucking fresh water to lay their eggs. The large sea lamprey is nearly three feet long. It has no lower jaw, its mouth is permanent, and it is provided with horny teeth by which the animal fastens itself to other fishes, on the blood and mucus of which it lives. There is a small opening, the gill openings on the side of the neck. They are used as food in some places. Allied are the hagfish, which become true parasites, attaching the body of a fish through the gills and completely devouring the flesh in a single night. The hagfish are not common on our east coast; they are more abundant in Europe and California.

**Lark.**—The common name of birds comprising the groups *Aloues* and *Sturnes* in the zoological nomenclature of Europe, the most harmonious of this musical tribe, commences its song early in the spring, and continues it during the whole season. It is one of those few birds that sing while on the wing. When it first rises from the earth, its notes are few and interrupted, and then, as it ascends, they gradually swell to their full tone, and long after it is out of the sight it continues to charm the ear with its melody. It is not dangerous, and is generally harmless, but descends in an oblique direction, and is sometimes dangerous, when it drops like a stone. The meadow lark, of North America, about ten inches long, somewhat resembles the skylark in its habits, but its song is not so sweet.

**Leeches.**—A group of flattened worms found almost entirely in fresh water, though in Asia there are species which live on the land or in trees. At the anterior end is a sucker, and there is a second at the hinder end. The anterior sucker surrounds the mouth, and this, in some species has radiating tentacles, and in others like a pair of jaws. With these they suck the blood of higher animals, sucking their blood through the wound. Half a century ago leeches were extensively used by physicians in the attempt to relieve certain diseases, but it has since been found out that the system needs strengthening, not weakening, and the use of leeches has ceased.

**Leopard.**—The *Felis pardus* differs from the panther by having small spots thickly set, while the panther's spots are large and open. The species is found in both of Africa and Asia, and is one of the fiercest and rapacious animals in about four feet long. It can take surprising leaps, swim, crawl, and climb trees.

**Lion.**—The largest and most majestic of carnivorous quadrupeds. It is, in many matters, of a nearly uniform tawny or yellowish color, and on the under parts, the young alone exhibiting a paler color. It is like those common in the *Felidae*; the male has usually a mane, and the mane of the male and the tail, which is pretty long, terminate in a tuft of hair. The whole frame is covered with a short, but very coarse hair, of extremely muscular, and the muscles of the head, are remarkably powerful, giving, with the broad, bright eyes and the noble appearance to the animal, which, with its mane, has led to its being called the king of beasts. A lion is the largest of the mammalia, and is from the nose to the tail, and the tail is eight feet long. The lioness is smaller, has no mane, and is of a lighter color on the under parts. The strength of the lion is such that he can carry off a buffalo as a cat carries a rat. The lion is chiefly an inhabitant of Africa, although it is found in Asia, particularly in certain parts of Arabia, Persia, and India. It was anciently much more common in Europe, and was found in the parts of Europe (Macedonia and Thracia), according to Herodotus and other authors. The lion is an

inhabitant of open plains in which the shelter of occasional bushes and thickets may be found. It is easily tamed, at least when taken young and well fed, and is supplied with good food, and was made to contribute to the sports of the ancient Romans; a combat of lions was an attractive sight, and the Roman emperors were reported to have been, for the amphitheater.

**Lizards.**—A group of four-footed reptiles occurring in warmer climates, and especially in the tropics. The body is covered with scales on both back and belly, while the head is covered with large scales, and scutes. It is important when the question comes up regarding a legless form, which look like snakes, the presence of the scales, instead of scales, is a good guide at a glance their proper position. Most of the lizards are insect eaters and thus do much good. Only a single one, the Gila monster, is poisonous. Some of the larger tropical species are used as food. Some of the species have a great capacity for changing the color to correspond to the surroundings. This is most marked in the chameleons of Africa, and exists to a less extent in some of our American species which are popularly called by the same name. The change of color is due to the enlargement or contraction of small colored bodies in the skin. Among the interesting lizards are the horned toads of our southwest, the glass snake of the tropics, and the old world lizard, which break off at slight provocation, and then grow again; the frilled lizard of the East, which is a beautiful lizard; the lizard which is called the gecko of southern Europe, which crawl about on the ceilings of the rooms, uttering the noise of their claws on the floor.

**Llama.**—An animal of Peru, allied to the camels in structure and serving as the native beast of burden. It is a native of the high mountains of Peru, and is about the size of the common deer, with a long neck. It is capable of carrying about one hundred pounds of weight, and is a very hardy animal, which is kept for the hair, used as a textile material and greatly in vogue some forty years ago. When the llama is first sent to England, it should be kept on account of the difficulty of working it satisfactorily. Titus Salt solved the problem, and the llama is now used in the woolen industry, and alpacas defend themselves by spitting and biting, and many a visitor to ecological gardens has been a victim of the llama's spittle. These beasts, Llamas and alpacas are only known in a state of domestication; wild relatives are the vicuñas and guanacos of the high mountains of Peru, from which the llama and alpaca have descended from the wild.

**LOBSTER.**—The most important crustacean, occurring in the seas of all the world. It is found on the coast of northern Europe. The body is divided into two regions, the anterior bearing the head, and the posterior the tail. The body is large and pincers and four pairs of walking feet. At the front of the head are two pairs of feelers, the first pair being the largest, and the second pair of short stalks. The lobsters are fond of decaying fish and are among the scavengers of the sea. In the United States, the lobster is a valuable food, made out of lard and baited with decaying fish. The number taken is enormous, and overhunting has greatly reduced the numbers in the sea, so that almost everywhere laws have been passed to protect them. The annual catch on the New England coast is estimated at about thirty million pounds, the average weight of a lobster being between two and three pounds. Farther south on our east coast, in California and the Mediterranean a different animal is called lobster.

**MACAW.**—A genus of beautiful birds of the parrot tribe, distinguished by having their cheeks decorated with thick, fleshy, and brightly colored lobes. They are natives of tropical South America. The largest and most splendid is the great scarlet or red macaw, and the blue and yellow macaw are somewhat smaller.

**Mackerel.**—An important food fish occurring in the North Atlantic and characterized by the slender shape, the series of little fins on the tail and the very numerous scales. It is found in the waters of the North Atlantic states, but recently it has been comparatively scarce, possibly the result of overfishing. The black mackerel is common in the Spanish mackerel of our southern waters, and the large horse mackerel, which is not very abundant with us, but which is more common in the Mediterranean, where it is called the tunny. Large individuals may weigh over half a ton. It is a very voracious fish, and is found everywhere, being around nearly.

**Magpie.**—A bird belonging to the crow family. There are several species, and it is found in all parts of America. The common European magpie is about eighteen inches in length; the plumage is blue and white, but the black is more common; the bill is stout, and the tail is very long. The magpies continue in pairs throughout the year, and are very faithful to their mate, and are very intelligent. They are determined robbers of other birds' nests, destroying the eggs and young birds. They are celebrated for their sagacity and instincts, their power of imitating words, and

their propensity to purloin and secrete glittering articles.

**Mammals.**—One of the great groups of vertebrates, including all the so-called land animals. The term animal really has a much wider meaning and includes all living forms that do not plant and animal life. The mammals are the warm blooded, by bringing forth the young alive and nourishing them with milk secreted by the mother. The mammals are the most numerous of the animals, and do not lay eggs the only exceptions are three small forms found in Australia (marsupials). These forms are called marsupials. Next above them are the macropods, in which the young are very immature when born. Therefore they are taken into the group on the ventral side of the mother, where they remain until able to shift for themselves. To this group belong our opossum, all of the others, including the kangaroo, wombat, sugar squirrel, etc., belong to Australia and the adjacent islands. Next are the insect eaters or insectivores, including our mole and shrew; then come the rodents or gnawers (squirrels, rats, mice, porcupines, rabbits, beaver, etc.), in which the front teeth are fitted for gnawing. The ungulates are the hoofed animals and are divided into two groups according to the number of toes on each foot. The odd-toed group includes the horse, the even-toed group (cattle, sheep, deer, antelope, camel, etc.). The highest group is the primates, which are restricted to Asia and Africa, but forms spread over Europe and America is the species known as the man.

Another group in the bats, the only flying mammals, which have a wing of skin supported on the extremely long bones of the forelimbs. The bat feeds on insects, but in South America there is one which is said to suck blood (vampire), and in Asia there is one which feeds on man. The bat forms an additional group, wonderfully adapted for aquatic life, also are the sirenia (manatees) and dugongs, which are large aquatic mammals, with teeth adapted to eating fish and cracking bones. Here are the bear, weasels, otters, moles, muskrats, fish-eaters, and the long line of cats, while the seals and sea lions form an aberrant aquatic side branch. Lastly come the primates, a group including the monkeys, apes and man.

**MANATEE.**—The sea-cow, a gregarious aquatic mammal, found on the coasts of Florida and tropical America. They generally frequent the mouths of rivers, and are found in the shallow waters of littoral vegetation as they can reach at high tide. Their anterior limbs or swimming paws are furnished with webbing, and they are able to move themselves along the shore. They are large, awkward, whale-like animals, attaining a length of eight to ten feet, and weighing from five hundred to twenty-five tons. The skin is grayish-brown, sparsely covered with hairs. Their flesh is excellent food, and is much valued, but the animal is not become rarer. An ally with similar habits is the dugong of Australia.

**Mandrill.**—A species of baboon distinguished by the short or rudimentary tail, by the elongated, dog-like snout, and by the presence of buttock coloration which are generally brightly colored. It has cheek protuberances colored with stripes of brilliant red and blue. The mandrill inhabits western Africa, where they associate in large troops. Full-grown males measure about five feet; they are exceedingly strong and muscular, and fierce disposition.

**Mice.**—Small mammals of the group of rodents, belonging to the order of mammals. They are the most common of all mammals, and are an immigrant from our common house mouse is an immigrant from Europe. Its habits are well known. There are some twenty species of mice, and the white or albino mice, which are interesting as pets, since they are less apt to bite than the wild stock. The Japanese house mouse is a pest, and is known turning around every few seconds. The field mice are different species.

**Moccasins.**—A species of snake of the warmer United States, related to the rattlesnake, but lacking the rattles characteristic of the latter. It is more common in the southern states, and is found in marshy places in search of frogs and other animals on which it feeds. It is a very venomous snake.

**Mocking bird.**—A genus of the family *Turdidae*, or thrushes, exclusively American in its distribution, and ranging from the Gulf of Mexico to the Pacific. These birds are remarkable for their power of song. The best known species is *Mimus polyglottus*, which has made it famous, and is able to imitate almost any species of animals, as well as notes produced artificially. Its own song is loud and clear, and its plumage is decidedly somber, being of a general ashy-gray hue, paler beneath; its sweet and varied notes, and its power of imitating other birds, is a prime favorite.

**Mongoose.**—One of the small carnivoran mammals of India, much used by the natives for its voracity and courage. It does not hesitate to attack the most venomous serpents, killing them by its bite and having no fear of the venom. It is an excellent hunter and is able to dodge the blow. An



resemble small pigs. The best-known species are the collared peccary and the white-tipped species. The former occurs abundantly in South America, and also occurs in North America, being generally in small packs, which do not hesitate to attack with their tusks any one who comes within their reach. Their food consists of roots, tubers, sugarcane, melons, and cultivated fields suffer much from their raids. The flesh is savory, and the animal has wings. The peccary possesses a glandular skin, situated in the loins, which secretes a strongly-smelling substance. This must be rubbed on the animal, killing a peccary, to avoid contamination of the flesh.

**Fish.**—Fish-eating swimming birds of the warmer regions, with a large pouch of skin between the halves of the lower jaw. In fishing they swim, striking the surface of the water with their wings, scooping the fish into the pouch, and later retiring to the shore to devour them. There are two species in the Gulf states, one white, the other brown in color.

**Fregul.**—The name of birds which form the order Fregulæ. Their wings are very small and hard; are covered with small stiff feathers of a bristly nature, and are absolutely useless for flight; the birds swim well, using both their webbed feet and their wings. There are about eighteen species, entirely confined to the Southern Ocean, and are a marvellous rapid swimmer, and are the aunts and divers of the northern sea. During the breeding season they resort to rocky islands in immense numbers, and are very noisy and noisy birds under them. Their food consists chiefly of fish.

**Fresh.**—The common name for several species of fish in both fresh and salt water, all of which are characterized by having spines in the fins and hard scales. The name properly belongs to the fresh-water species, which are of some value as food.

**Fowl.**—A species of birds related to the albatrosses and varying in size from Mother Cary's chickens, an inches long, to the fulmars, three feet in length. All of them live on the high seas, and many of them will follow a ship for days for the scraps thrown overboard. At night they follow close behind the stern of the ship.

**Fowls.**—A group of birds, including some three hundred species, distributed in nearly all parts of the world, all of which are so numerous that no one is in any doubt about the membership of any form in the group. Most of the domesticated animals, with the exception of the pig, are of the differences which in other groups would be considered as distinct species or even genera, are derived from the same stock. The most interesting species are the passenger pigeon, which yearly years ago formed one of the most numerous of the eastern part of our country, but which is now nearly or quite extinct. The most beautiful of the group is the peacock, which was the pride of the Indian ocean, and the most beautiful of the group. The largest member of the group was the dodo of the islands in the Indian ocean, which became extinct. The dodo was a very large bird, it lacked the power of flight. It was somewhat larger than a turkey, with the same external appearance but with a head and a pair of legs, like those preserved in the museum at Oxford.

**Fowl.**—A name common to several species of the weasel family. The common polecat is found in Europe. It is about seventeen inches long, the tail six inches. The color is dark brown. It is nocturnal, sleeping during the day and searching for its prey at night. It is destructive to poultry, rabbits, and game, so that in Britain it is being rapidly exterminated. It has glands beneath a cold finger, somewhat like the glands of the American skunk, which it ejects when irritated or alarmed. Its fur, which is imported in large quantities, is known as fisher's hair from the superior artist's brushes.

**Porcupine.**—A group of large rodents characterized by having some of the scales of the tail large spines or quills. These ordinarily lie flat, but when disturbed the animal rolls itself into a ball, and the quills with their barbs stand out, and stand outward, forming a very efficient defense. The quills come out very easily but there is no loss to the statements that some animals have the power to shoot them. Our American species has quills about three inches in length. It feeds upon bark of trees, which it gnaws off with its teeth, and it may do great damage. The species found in southern Europe and northern Africa lives in the ground and is about the size of a mole, and is as large in diameter as a lead pencil.

**Pogey.**—A food fish on the eastern coast from Cape Cod south, known also as pogey, anahone, one of the herrings, which is taken extensively for oil.

**Pogey.**—A very small whale, belonging to the group of dolphins, usually known as pogey in length. It is usually blackish above, lighter even white beneath. It feeds on fish, and schools of porpoises are seen following schools of small fish. Like all of the whales the porpoise is compelled to come to the surface to breathe. They are one of the most common whales on an ocean voyage.

**Pogey.**—Small rodent animals of the squirrel family, found on the plains east of the Rocky

mountains. They resemble their allies, the marmots, in appearance, and have well-developed claws on all the toes of the fore-feet; shrill creaks (sometimes with a rattling sound) are the only foot in length, and has a tail of about four inches. On the upper surface it is reddish-brown, and on the under surface it is black. It is found in great societies on those portions of the prairie where the buffalo grass grows luxuriantly. Here it is very tame, and is not afraid to approach to each other, and when the little creature is out, quite a busy scene is presented. The name is derived from the resemblance between its cry and the bark of a small dog.

**Puma (or cougar).**—A carnivorous animal peculiar to the mountain regions of the western part of the continent as a destructive or dangerous creature. It is known as the American lion, but it is considerably smaller than the lion of Asia. Its body length is about fifty inches, exclusive of a tail of twenty-six inches; its height is about two feet. The range is extensive, though it is less abundant in North than in South America, where it haunts a variety of situations, equally at home in dense forests, open plains, and the Andes to at least 10,000 feet. It is cowardly, and is not regarded with fear by man. Unlike most of the larger cats it is remarkably silent.

**Python.**—A genus and family of serpents allied to the family of boas. They are not venomous, but are very dangerous to man, and are not to be trusted. A python is a large snake, and belongs exclusively to the old world, and are of enormous size, sometimes attaining a length of thirty feet. A rudimentary pair of arms, called hinder limbs exist, terminating externally in a hooked claw. The head exceeds the neck in length, and the mouth is very large. It is aided by their prehensile tails, the pythons avoid themselves from the branches of trees and do not wait near water for animals which come to drink.

**Quail.**—A common name of different species of

**Raccoon.**—A small family of plantigrade carnivorous mammals, bear-like in appearance and of small size. The raccoons are peculiar to America, where they range from British Columbia and Canada to Paraguay. The common raccoon is a pretty animal, about the size of a cat, but stout; it has a long brown or grizzled coat, a ringed and bushy tail, and a turned-up nose. It is a very useful animal, and is very useful for digging or climbing. In its attitudes it is somewhat monkey-like, and usually sits upon its haunches, with its feet and its head raised forewards. It has a curious habit of washing articles given to it, and of soaking food in water before eating it. Its skin is very valuable.

**Rat.**—The common name of a group of rodents which have accompanied man over the earth. They were introduced into America by the Spaniards about two hundred years ago the musk ferret gray rat (also called Norway rat) appeared in the United States from Asia, and has since become a large part of the earth, practically exterminating the black rat. White rats are almost varieties of the black rat. The damage done by these verminous has always been so great as to warrant all sorts of measures for their extermination, but more recently the indifference against them has been more severe, as it is found that they are important means of distributing disease, especially the bubonic plague, which is apparently the same as the black death that made such ravages during the middle ages.

**Rattlesnake.**—A genus of poisonous snakes of America in which, when the skin is shed each year, a portion of the old skin remains, in a dry condition, until the end of the tail, this forming the rattle. When the snake sheds its skin, the rattle of the tail rapidly and the dried rings of skin are thrown off, and the rattlesnake is thus made of the snake may be known by counting the rings of the rattle, one for each year and one for the first year. The rattlesnake is a very dangerous animal, being injected by means of the poison fangs, two long teeth in the upper jaw, which are tubular; the poison gland is in the head, and the poison is secreted into the fangs.

**Redbreast.**—A bird of the family Sylviæ, familiarly known in the British Islands and throughout most of Europe. It is generally designated as the robin, and is a very common bird. Its length is about five and three-fourths inches, but it is of a rounder and fuller form than many of the birds of the same size. Its plumage is strikingly contrasting with the form of the body. The wings are rather short. The tail is scarcely longer than the head, and the under surface is a reddish orange-brown is a conspicuous characteristic, particularly of the male. The name robin is given to the European bird, and is applied to a species of thrush.

**Reptiles.**—A great group of vertebrates, including the snakes, lizards, crocodiles, and alligators. A number of extinct species, some of bizarre shapes and enormous size. Reptiles are characterized by having a scaly skin, breathing by lungs, served by gills, and by having blood which is about the temperature of the surroundings, commonly called cold blood. They give rise to a great variety in internal structure, some of which may be mentioned. Thus the heart has three chambers, the third not being completely divided, except in the

alligators. There are two aortic arches carrying the blood back from the heart. The skull articulates to the vertebral column by a single rounded knob (condyle) which produces eggs, but some of the snakes retain them, and the body of the snake hatched. Reptiles and birds resemble each other in several parts of their anatomy, such as the group of *Saurapoda* (reptile-like). Snakes and lizards are closely related, both having the scales merely horny plates, and both having a movable body inserted between the lower jaw and the skull. In the crocodiles and turtles this is not the case, but the body of the snake is inserted between the lower jaw and the skull. In the crocodiles the scales are strengthened by the formation of bone beneath the horny portions. Most reptiles have teeth, but the turtles lack them, the jaws being covered with horny sheaths. Some of the snakes and a single lizard (the Gila monster) are poisonous, and the poison glands being developed in the mouth.

**Rhinoceros.**—The name of a family of mammals, represented by nine living species, characteristic of Africa south of the Sahara, India, Borneo, and Java. They have large unwieldy bodies; short thick legs, terminating in large pads, and a few bearing toes; large elongated heads, with a long horn or horns springing from the snout in existing species, and in some extinct species the horn or horns are extremely thick. Five species belong to Africa, all possessing two horns. Of these, the white rhinoceros is the largest, and has a length of over twelve feet and a height of nearly six feet; but the black rhinoceros is best known. The Asiatic species is the Indian rhinoceros, and the appearance of armor plates. They are smaller and two of the species possess double horns, and a single one. The Indian rhinoceros, a one-horned species, is the one usually seen in menageries in this country. It leads a tranquil, indolent life, wallowing in mud, and grazing in the rivers. Owing to the keenness of its smell and hearing, the rhinoceros cannot be easily attacked; but when provoked it rushes with great fury and impetuously.

**Sable.**—A carnivorous mammal, nearly allied to the common raccoon and placed in the same family in Siberia and Kamchatka, and hunted for its fur. Its length, exclusive of the tail, is about twenty inches, and its weight is about thirty pounds, and hence of the very highest value, is generally brown, grayish-yellow on the throat, and with a white patch on the side of the neck. It is denser during winter, and owing to the mode of attachment of the hairs to the skin it is very smooth in any direction. Two other species are the sable and the muskrat, the latter a North American species. The Tartar sable is the name given to a species of the weasel genus found in the mountains of the Altai, and the pekan of North America is sometimes known as the Hudson bay sable. The skins of all these animals are frequently used in the manufacture of hats to imitate the true Russian sable. Sable hair is also used in the manufacture of artist's pencils. Sable fur has been of great value from early times.

**Salmanders.**—A group of amphibians which have four legs and a well-developed tail. Like all of the amphibians, they breathe when young by means of gills, some retaining them through life. They may be distinguished from the fish by which they are often confined, by the smooth skin, in which there are never any scales. Most of the species live in water, usually in the water. From these the gilled young hatch out. They are carnivorous or insectivorous. In the adult stage, some are more than two feet in length, and are burrowing beneath the soil or under stones, seeking their prey at night. None are poisonous, except the hellgramite, which is a very small, and secretes an acrid juice. Our largest species is the mud puppy (*Necturus*) of the Mississippi basin; the largest of the salamanders is the giant salamander of Japan, three feet in length.

**Salmon.**—A well-known fish, forming the type of the family Salmonidæ, and is found in both salt and fresh waters, and ranks among the food-fishes. It generally attains a length of from three to four feet, and has an average weight of from twelve to thirty pounds, but these limits are frequently exceeded. The adult fish is a steel-blue on the back, and the sides becoming lighter to the sides and belly. It usually continues in the shallows of its native stream for two years after hatching, and then it migrates, attaining a length of eight inches. When the season of its migration arrives, the fish have become darker and the fish use ascending to the head of the stream, and a small or salmon fry. The smolts now congregate into shoals and proceed seaward. On reaching the open sea, the smolts are then called salmon, and after a short time and then make for the open sea. Leaving its native river as a fish weighing, it may be more than two pounds, it may be less than three months' absence, may return to fresh water as a pike, weighing four or five pounds. In the gill stage, the fish is very delicate and tender. After spawning in the fresh water the gill stage begins the sea in the autumn, and when it comes stay in the ocean is over a year after a few





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1. Bronze Copper Butterfly.  
2, 4, 10, 21. Horned Beetles.  
3. Gipsy Moth.  
5. Pine Weevil.  
6, 13. Grain Weevil.

7. Locust.  
8, 14. Monarch Butterflies.  
9, 19. Tussock Moth.  
11. Seed Weevil.  
12, 22. Lantern Fly.

15. Brazil Moth.  
16, 24. Butterflies.  
17. Swamp Fly.  
18. Fruit Fly.  
20. Chinese Candle Fly.

23. South American Silk Worm.  
25, 26, 27, 28. Water Beetles and Larvae.  
29. Wood Borer.

that its bite causes madness which can be cured only by music. So far as is known there is only one species which can cause serious effects by biting man, and even these cases are not sufficiently authenticated.

**Squid.** *Loligo*, mollusks closely related to the cuttlefish. It has a barrel-shaped body, with a head in front bearing ten pairs of tapering tentacles, each with numerous suckers. On the side of the head is a well-developed eye. Squid live largely on the bottom with a few species that come to the surface biting them with a pair of parrot-like jaws. They are largely used as bait in fishing, and to a limited extent as food. The average length is a foot or two, but in the seas around Newfoundland and Japan giants are occasionally found with bodies 10 feet in length and 10 inches in diameter, weighing 100 feet in size. These were comparatively abundant about 1875, but none has been reported for years.

**Squirrels.**—A group of rodents, too well known to need description. They are abundant in all of the northern hemisphere, living in trees and feeding largely on nuts, etc. There are several species in the United States, the fur of the larger kinds having considerable value. Nearly related are the ground squirrels or chipmunks, and the flying squirrels, which really do not fly but glide by means of a parachute of skin extending between the legs of each side.

birds or each side.

**White Stork.** A family of birds, chiefly confined to the old world. The true storks number six species, ranging over Europe, Asia, and Africa, and found also in South America. They resemble the herons, but are more robust, and have larger bills, shorter toes, with a nonretracted claw on the middle toe. They inhabit the vicinity of marshes and rivers, where they find their chief feeding of frogs, fish, snakes, and even young birds. They are migratory, arriving at their breeding haunts in the early spring and departing again in the autumn. The white stork is common in Europe, constructing a large nest, most frequently on the chimney of a

**Swallow.**—Any one of 125 species of birds belonging to the family *Hirundinidae* characterised by the very wide gape of the mouth, to which the common name may allude. All are noted for their graceful flight habits. They feed almost exclusively on insects and hence are very valuable. Among our common swallows are the purple martin, the cliff swallow, the barn swallow and the sand martin. The so-called chimney swallow is, strictly, not a swallow, but a swift.

**Swans.**—Swimming birds, closely related to the ducks and geese, with long and slender neck, bills about as long as the head, and with a soft cere. Nine species are known, one coming from Chile, the black swan from Australia, and the others from the northern hemisphere. We have two white species, the whistling and the trumpeter swans, but the tame species are all of European origin. As swans were bred for the table, now

**Taptars.**—A genus of hoofed animals with an odd number of toes on the hind feet. All are tropical, some living in Asia, others in America. All are bulky beasts, recalling somewhat the swine in appearance. They have the snout prolonged into a flexible proboscis with the nostrils at the tip. Their flesh is said to be good.

**Thrush.**—Any singing bird belonging to the family *Turdida*. They are represented with us by the wood thrush, Wilson's thrush, our common robin and several others. The wood thrush is the best singer of our species; the European song thrush is much like our wood thrush but is less

**Ticks.**—A group of semiparasitic animals nearly related to the spiders. The young attach themselves to some higher animal, and then begin to burrow the head under the skin in order to suck the blood. Man and domestic animals are affected by them, and one species is now known to convey the Texas fever to cattle.

[illegible]

**Toads.**—The common name of any amphibian without a tail, no teeth and a warty skin. They are common in most parts of the world, there being few in the Australian region. They are mostly nocturnal, and, as they feed on insects, they are among the best friends of man and deserve en-

couragement. The warts are caused by glands in the skin which secrete an acrid fluid, the chief means of defense, as few animals will touch them. It is scarcely necessary to say that they are perfectly harmless to man, and that they cannot

**Trout.**—A common name for several fishes with soft rayed fins and a small fin without rays on the back, behind the large fin. They have very small scales. All are excellent eating and all are regarded as good for the table. Trout is typical of cold water fishes. This thrives in the coldest and clearest streams, laying its eggs in December or January. Other species in North America are the lake trout and the salmon trout in the east and the rainbow and the brook trout in the west. Europe has the brown trout and the sea trout. The rainbow trout is native to the Pacific coast of the northern hemisphere, but they have been introduced into Australia and New Zealand.

**Turkey.**—A large scratching bird, a native of America, from Canada to Central America. It is chiefly known now in domestication, but is still found wild in some parts of the United States. The tame birds differ some in appearance from the birds in a state of nature. The name was given under the misapprehension that they came from Turkey.

**Turkey buzzard.**—A large vulture, common in the southern half of our country. It feeds on carrion and thus makes an important scavenger and is protected in some states. It is remarkable for its sustained sailing flight.

[illegible]

vertebrates.—One of the great groups of the animal kingdom. The vertebrates have a backbone, or vertebral column, which protects the spinal cord and contains the brain. The alimentary canal lies entirely below this central skeleton, and the organs of respiration are always connected with the body by a blood vessel from the back of the throat to the exterior, or lungs connected with the throat by a windpipe. The heart is always between the lungs and the alimentary canal, and the blood, but in the higher forms it is carried back into the chest. Some lack legs or their equivalent fins, but most have two pairs of these structures. The reproductive system is always on the ventral line of the back and belly. All reproduce sexually by eggs, there being no cases of division or budding, so common in the lower divisions of the animal kingdom.

**Walrus.**—A marine carnivorous mammal, closely related to seals and sea lions, with enormous downward-curving tusks, or canine teeth, projecting from the upper jaw, which sometimes reach a length of six inches. The skin is covered with small scales, and a thick slummy body, deep-set at the shoulders, and their feet are adapted for swimming. They reach a length of twelve feet or more and a weight of 10,000 pounds. They are found in species on the Atlantic and on the Pacific. The Atlantic form is found on the coast of Labrador and Hudson's bay, but formerly extended farther southward. They feed largely on clams and other mollusks, and also on fish, especially herring and capelin. Their tusks are hunted for their hides and oil.

**Wasp**—A pup of insects with two pairs of wings, the hinder pair the smaller, and a well developed stinging with a poison gland connected, at the hinder end of the body. They dig deep nests in the soil, and their stings in common words that will separate them from the ants and the bees. Some are solitary, and some form colonies in which the individuals work together. The honey bees, bumble bees, and wasps are the digger wasps, which excavate holes in the soil, or in wood, which they store with insect food. They lay their eggs in the mass, so that the young, or hatching out will have abundant food. Others make a mud nest, and lay their eggs in the mud, and some make nests for the eggs by sticking mud to beams in barns and in other similar places. The social wasps make a nest in common, sometimes in the holes of trees, and sometimes in the holes of old nests make paper nests from bits of decaying wood, which they chew into a real paper pulp. In the latter case the males make the nest, and the females live to form a new colony in the

**Weasel.**—The name of a number of small carnivorous mammals related to the sable, mink, and

skunk. They have a remarkably slender, round body with a long neck, which gives the animal the appearance of having the fore legs set back too far. The legs are short and stout. The animal is found mostly in the old and the new worlds, reaching a length of eight or ten inches; it is light reddish-brown and whitish below, and in northern distributions it is more or less black. It is found in mice, moles, and rats, following them into their holes, and even rabbits fall a prey to it. It rarely visits hen-yards. The stoat, or ermine, likewise has a long neck and a slender body, and is known to eleven inches long. In summer its color is mahogany brown, with a black tip to the tail. In winter it changes in northern regions to a pure white.

**Weevils.**—A group of beetles in which the head is prolonged into a snout with the jaws at the end. With this they bore into plants of all kinds to lay the eggs, the grub hatching out feeding upon the substance. Hence they are considerable pests. Over 400 species have been described from the United States. Farmers often apply the name to other injurious insects, some of which are not even beetles.

of the popular name of the larger Isopoda, particularly of all those belonging to the families *Balanoidae* and *Palaeodidae* or *Catenodidae*. In the latter the head is furnished with a pair of antennae, and is entirely destitute of teeth, instead of which the palate is furnished with an apparatus of baleen, or bristles, which are attached to the sides of the water the small crustaceans, which form the food of these whales. The fibrous structure of baleen, and the manner in which it is attached to the jaws, are well known. The plates of it in the mouth of a whale are very numerous, several hundred in number, and are so closely joined together, so that the mouth is filled with them. The head of whales usually has a small, pointed, cartilaginous snout, of great length. The lower surface of the true skin extends into a thick layer of blubber, an open network of blood vessels, and a white fat is deposited between the skin and the blubber. The thickness of the blubber varies from one foot to two or three feet. The blubber is the most important source of food for the whale. The most important species of baleen whales is the *Meleagris*, or right whale. It inhabits the seas of the northern part of the world, and abounds chiefly in the arctic regions. It is the largest of all whales, and attains a great length. It was formerly supposed that the Greenland whale was an inhabitant of the southern part of the world, but it is now known to be a

[illegible]

**Whip-poor-will.**—A bird widely known on account of its peculiar cry of "whip-poor-will." It is seldom seen, although abundant in the western part of the eastern United States. It usually rests on the ground during the day and is active at early nightfall, sending forth its cry, and also courting the female by flying over her head and catching the long grass in search of insects. It is about the size of a thrush, with a long, straight, grayish bill, more variegated with black and buff. Its bill is very broad, its mouth large and provided with a tuft of long bristles. It builds no nest, but deposits its eggs on leaves or a slight depression in the ground. It is often called the "screech-whip-widow and the night-hawk."

**White ants.**—A group of insects which are not at all related to the true ants, but which are so called because they live in colonies like the true ants. So the name termites is better for them. In the colonies there are different kinds of individuals. Only the king and queen (male and female) are winged, and these have only to do with the perpetuation of the species. Then there are the workers and the soldiers, whose duties are indicated by their names. The white ants feed upon wood, burrowing holes in every direction through it and never, if they can help it, coming into the

daylight. In the tropics they are very destructive and they will frequently riddle a house with their ravages being suspected. They are more rare in cooler climates, but they extend into New England. Some of the most common are immense nests of clay and chewed wood, ten or fifteen feet high and twice that across.

**Wolf.**—The name applied to several species of carnivorous animals, belonging to the dog family. The common wolf is about five feet in length including the tail, which is twenty inches, and about thirty-two inches in height at the shoulders. The muscle much resembles that of a sheep; but the ears are upright and pointed, and the eyes are set obliquely. The coat is subject to variation in tint, depending much upon the country the animal inhabits. Perhaps the most usual tint is a yellowish-gray; but it is sometimes almost black. In Europe the animal is still found in Lapland, Norway, Sweden, Russia, Poland, Hungary, and some districts of Germany, France, Italy, Spain, and Greece. In Britain, the last wolf was slain in 1860, but in Ireland the species lingered until 1710. The wolf of India is considered a distinct species, and has a dingy reddish-white fur. The North American wolf has a wide

range, extending from Greenland to Mexico, and is closely similar to the European race. **Woodcock.**—A famous game bird belonging to the snipe family, and found in northern parts of both the old and new worlds. The American woodcock is about eleven inches long, variegated in black, brown, gray, and rusty colors. The bill is very long and flexible at the apex. It is thrust into the soft ground, in search of earthworms, and the presence of woodcocks can often be detected by a cluster of these holes. The European bird is larger.

**Woodpecker.**—The common name of any of three hundred birds which have climbing feet, stiff tail feathers and which bore into trees for grubs on which they feed, though some of them are fond of fruit and other vegetable food. Most of the species have barbed and pointed tongue with which they spear the larva, but in some the tongue is armed with a sticky substance, secreted by glands in the throat. There are no woodpeckers in Australia or Madagascar, but they occur in all other parts of the world.

**Wren.**—A genus of birds having a slender, slightly curved, and pointed bill; the wings very short and rounded; the tail short, and carried erect, the legs slender, and rather long. Their plumage

is generally dull. They live on or near the ground, seeking for insects and worms among tree trunks and in other similar situations. The European wren is next to the smallest bird in Europe; it is most numerous in the south both in the central and southern parts. It frequents gardens, hedges, and thickets. The North American species of wren are numerous, and in some are larger than the European wren, and is abundant in the eastern parts of the United States. It often builds its nest near houses, and in boxes prepared for it. The song is very sweet. The male is a very bold, pugnacious bird, readily attacking birds far larger than itself as the titmouse and swallow.

**Zebra.**—A name sometimes given to all the striped *Equidae*, native of South Africa, but also, in a more restricted use, designating a single species, *Equus zebra*. All resemble more the ass than the horse. The zebra is about eight hands high at the shoulder. It is light and graceful, with slender limbs, the ground color creamy; the head, neck, body, and legs striped with black, closely related are Burchell's zebra and the quagga, differing in the distribution of the stripes. Zebras are practically untamable, though they have been driven in herds.

**WEIGHTS AND MEASURES.**—Practically all the commerce of the world is conducted through the medium of two systems of weights and measures, namely, the English system and the metric system. Practically all the engineering work done in the world was the exception of that done in Japan is based upon one or the other of these systems. In the United States and in Great Britain its possessions both systems are legal and in use, the English being used in all ordinary commercial transactions and the metric in all scientific work and to a lesser extent in technical work.

**The English System.**—The customary system of weights and measures in use in the United States is the same as the system in everyday use in Great Britain, with some important differences in some of the units which must be noted. For all practical purposes the units of length and mass are identical in value, although the fundamental standards of the two countries are quite different. In Great Britain the standard yard is a bar of metal in the custody of the board of trade and preserved in the standards office, Westminster. Its legal value in terms of the international meter is, one yard equals  $\frac{3600}{3937}$  meters.

In the United States the meter is the fundamental standard and the yard is defined as  $\frac{3600}{3937}$  meters. The difference in the value of the two yards in terms of the meter only amounts to a little more than one part in 400,000, which is about the difference found in comparing the imperial yard with its authentic copies at different periods. It is therefore doubtful whether there is a real difference between the length of the English standard yard and United States yard derived from the meter.

A similar condition exists with respect to the avoirdupois pounds; in England a certain platinum cylinder deposited in the standards office is regarded as the standard pound, while in the United States the pound is defined as  $\frac{453.592427}{1000}$  grams, of which the international kilogram contains 1,000. This is the same as the legal value in Great Britain, so that the only difference in the two pounds is one of standards. On the other hand the capacity measures of the two countries are quite different. The United States gallon of 231 cubic inches and the Winchester bushel of 2150.42 cubic inches have not been legal measures in Great Britain since 1825, having been superseded by the present imperial gallon, which is defined as the volume of 10 pounds of pure water at 62 degrees Fahrenheit, weighed against brass weights in air at the same temperature as

the water, and with the barometer at 30 inches. The imperial bushel is defined as the volume of 80 pounds of water weighed under the same conditions as the gallon. The bushel of Great Britain is, therefore, exactly equal to 8 gallons.

The volume of the imperial gallon, according to the most reliable data available at this time, is 277.420 cubic inches and the bushel 2219.36 cubic inches, the first being larger than the United States gallon by approximately 20 per cent, and the latter larger than the United States bushel by 3.2 per cent.

The methods of subdividing and multiplying the yard, pound, gallon, and bushel in the two countries are substantially the same.

#### Standard Weights and Measures of United States

##### AVOIRDUPOIS WEIGHT

Dram	.....	gr.	= 27 1/2 grains (7.34375).
Ounce	.....	oz.	= 16 drams, 437.5 grains.
Pound	.....	lb.	= 16 oz., 256 dr., 7,000 grains.
Long	.....	st.	= 14 lb., 112 oz., 3,500 grains.
Quarter (Eng.)	.....	qr.	= 28 lb., 448 oz., 14,000 grains.
Quarter (Can.)	.....	qr.	= 25 lb., 400 oz., 12,500 grains.
Hundredwt. (Eng.)	.....	cwt.	= 100 lb., 1,600 oz., 50,000 grains.
Hundredwt. (Can.)	.....	cwt.	= 100 lb., 1,600 oz., 50,000 grains.
Ton (Eng.)	.....	T.	= 20 cwt., 2,240 lbs.
Ton (Can.)	.....	T.	= 20 cwt., 2,000 lbs.

**Ton of Coal.**—The United States ton is legally defined in some states as 2,000 pounds and in other states as 2,240 pounds. In Arizona, Colorado, Connecticut, Idaho, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, Montana, Nebraska, New Jersey (net ton), New York, Ohio, Rhode Island (net ton), Vermont, Washington, and Wisconsin it is fixed at 2,000 pounds, and in the District of Columbia, Pennsylvania, New Jersey (gross ton), Rhode Island (gross ton), it is fixed at 2,240 pounds. For tariff purposes Congress has fixed the ton of coal at 2,240 pounds.

##### TROY WEIGHT

Carat	.....	.....	= 3.17 grains.
Pennyweight	.....	wt.	= 480 grains.
Ounce	.....	oz.	= 20 pennyweights, 480 grains.
Pound	.....	lb.	= 12 oz., 240 pennyweights, 5,760 grains.
Hundred	.....	.....	= 100 lbs.

Troy is the weight used by goldsmiths and jewelers. The grains troy, apothecaries', and avoirdupois are equal in some states in England, France, and the United States, Holland, and in most other countries. The oz. troy and apothecaries' = 1.09714 oz. avoirdupois, but the lb. troy and lb. apothecaries' = 1.036226 lb. avoirdupois, while 175 lbs. troy and apothecaries' = 144 lbs. avoirdupois.

##### APOTHECARIES' WEIGHT

Scruple	.....	.....	= 20 grains.
Dram	.....	.....	= 3 scruples, 60 grains.
Ounce	.....	.....	= 8 drams, 240 grains.
Pound	.....	.....	= 12 ounces, 480 grains.

##### APOTHECARIES' FLUID MEASURE

60 minims	.....	= 1 fluid dram.	Marked
8 drams	.....	= 1 ounce.	.....
16 ounces	.....	= 1 pint.	.....
8 pints	.....	= 1 gallon.	C, or Cong.
1 dram	.....	= 1 teaspoonful.	.....
1 ounce	.....	= 1 dessertspoonful.	.....
4 drams	.....	= 1 tablespoonful.	.....
2 ounces	.....	= 1 wineglassful.	.....
1 ounce	.....	= 1 teacupful.	.....

##### LIQUID MEASURE

4 gills	.....	1 pint (O)	Cubic inches = 28.875
2 pints	.....	= 1 quart.	.....
4 quarts	.....	= 1 gallon (gal.)	= 231.0
63 gallons	.....	= 1 hogshead (hd.)	.....
2 hogsheads	.....	= 1 pipe or butt.	.....
2 pipes	.....	= 1 tun.	.....

##### DRY MEASURE

2 pints	.....	1 quart (qt.)	Cubic inches = 67.20
4 quarts	.....	= 1 gallon (gal.)	= 268.80
2 gallons	.....	= 1 peck	= 537.60
8 quarts	.....	= 1 bushel	.....
4 pecks	.....	= 1 struck bushel	= 2150.42

##### HOUSEHOLD MEASURES

120 drops water	.....	= 1 teaspoon.	.....
60 drops thick fluid	.....	= 1 teaspoon.	.....
2 teaspoons	.....	= 1 dessertspoon.	.....
3 teaspoons	.....	= 1 tablespoon.	.....
16 tablespoons	.....	= 1 cup.	.....
1 cup	.....	= 1 pt.	.....
1 pint	.....	= 1 qt.	.....
4 tablespoons	.....	= 1 oz.	.....
2 tablespoons	.....	= 1 oz.	.....
3 teaspoons	.....	= 1 oz.	.....
4 teaspoons	.....	= 1 oz.	.....
2 cups granulated sugar	.....	= 1 lb.	.....
2 cups confectioners' sugar	.....	= 1 lb.	.....
2 cups wheat flour	.....	= 1 lb.	.....
2 cups white wheat flour	.....	= 1 lb.	.....
2 cups wheat flour	.....	= 1 lb.	.....
2 cups coffee	.....	= 1 lb.	.....
2 cups butter	.....	= 1 lb.	.....
2 cups rice	.....	= 1 lb.	.....
2 cups lard	.....	= 1 lb.	.....
2 cups butter	.....	= 1 lb.	.....
2 cups Graham flour	.....	= 1 lb.	.....
2 cups rye flour	.....	= 1 lb.	.....
2 cups corn meal	.....	= 1 lb.	.....
2 cups rolled oats	.....	= 1 lb.	.....
2 cups powdered sugar	.....	= 1 lb.	.....
2 cups brown sugar	.....	= 1 lb.	.....
2 cups raisins	.....	= 1 lb.	.....
2 cups currants	.....	= 1 lb.	.....
2 cups bread crumbs	.....	= 1 lb.	.....
9 eggs	.....	= 1 lb.	.....

##### CUBIC OR SOLID MEASURE

Cubic foot	.....	= 1,728 cubic inches.	.....
Cubic yard	.....	= 27 cubic feet, 21,033 bushels.	.....
Cubic inch	.....	= 12 cubic feet, 1,728 bushels.	.....
Shipping ton	.....	= 40 cubic feet merchandise.	.....
Shipping ton	.....	= 42 cubic feet of timber.	.....
Ton of displacement	.....	= 35 cubic feet.	.....

##### LINEAR MEASURE

3 barleycorns, or.....	.....	1 inch (in.).	.....
12 lines, or.....	.....	= 1 inch.	.....
72 points, or.....	.....	= 1 inch.	.....
1,000 mils (mils), or.....	.....	= 1 inch.	.....
1 inch	.....	= 1 palm.	.....
4 inches	.....	= 1 hand.	.....
9 inches	.....	= 1 span.	.....
1 foot	.....	= 1 foot (ft.).	.....
18 inches	.....	= 1 cubit.	.....
3 feet	.....	= 1 yard (yd.).	.....
21 feet	.....	= 1 military pace.	.....
5 feet	.....	= 1 geometrical pace.	.....
3 yards	.....	= 1 fathom.	.....
64 yards	.....	= 1 rood, pole, or perch.	.....
66 feet, or.....	.....	= 1 Gunter's chain.	.....
4 rods	.....	= 1 furlong (fur.).	.....
40 rods	.....	= 1 mile.	.....
2,200 yards, or.....	.....	= 1 mile.	.....
1,760 furlongs, or.....	.....	= 1 mile.	.....
5,280 feet, or.....	.....	= 1 league.	.....

The hand is used in measuring horses' height. The military pace is the length of the ordinary step of a man. One thousand geometrical paces were reckoned to a mile.



## LAND MEASURE (LINEAR)

7.92 inches.....	1 link.
100 fathoms.....	1 chain (ch.).
164 feet.....	1 furlong (fur.).
10 chains.....	1 mile.
8 furlongs.....	

## LAND MEASURE (SQUARE)

144 square inches.....	1 square foot (sq. ft.).
9 square feet.....	1 square yard (sq. yd.).
360 square yards.....	1 square pole, rod, or perch.
16 square poles.....	1 square chain (sq. ch.).
40 square poles, or.....	1 square rood.
1,210 square yards.....	
4 square rods, or.....	1 acre.
10 square chains, or.....	
100 square poles, or.....	
4,840 square feet.....	
43,560 square feet.....	
640 acres, or.....	1 square mile.
2,087,680 square yards.....	
1 yard of land.....	1 rod of land.
100 acres.....	1 hide of land.
40 hides.....	1 barnum.

## GEOGRAPHICAL AND NAUTICAL MEASURE

6086.44 feet, or.....	1 nautical mile.
1000 fathoms, or.....	
10 cables, or.....	
1.1528 statute miles.....	1 knot.
1 nautical mile.....	
60 nautical miles, or.....	1 degree.
67.168 statute miles.....	1 circumference of the earth at the equator.
90 degrees.....	1 nautical mile.
1 league.....	120 fathoms.
1 cable's length.....	

## TIME

The unit of time measurement is the same among all nations. Practically it is  $\frac{1}{86400}$  of the mean solar day, but really it is a perfectly arbitrary unit, as the length of the mean solar day is not constant for any two periods of time. There is no constant natural unit of time.

1 minute.....	= 60 seconds.
1 hour.....	= 60 minutes, 3,600 seconds.
1 day.....	= 24 hours, 1,440 minutes, 86,400 seconds.
1 sidereal day.....	= 86,164.1 seconds.
1 sidereal month.....	= 27.212161 mean solar days (average).
1 lunar month.....	= 29.530589 mean solar days (average).
1 anomalistic month.....	= 27.55455 mean solar days (average).
1 tropical month.....	= 27.312182 mean solar days (average).
1 nodal month.....	= 27.212222 mean solar days (average).
Mean solar year.....	= 365 d. 5 h. 48 m. 46.4 s. with annual variation of 0.00539.

The change in the length of the mean sidereal day,  $\frac{1}{4}$  s. of the time of the earth's rotation upon its axis, amounts to 0.01262 s. in 2,400 mean solar years.

## ANGULAR MEASURE

There is perfect unanimity as to the standard angle (i. e., the right angle) and practical unanimity as to its subdivision, for the subdivision into grades, etc., once favored by the French, is now abandoned.

1 minute of angle or arc = 60 seconds.
1 degree of angle or arc = 60 minutes.
90 degrees of angle or arc = 1 right angle or $\frac{1}{2}$ of circumference.

Radius of angle or arc =	= arc same length as radius.
Radius of angle or arc =	= 0.01745329252.
Length of arc of 1" =	= 0.015707963268.
Length of arc of 1' =	= 0.000290888209.

**Time on Shipboard.**—The twenty-four hours are divided on board ship into seven parts, and the crew is divided into two parts or watches, designated *port* and *starboard* watches. Each watch is on duty four hours, except from 4 to 8 p. m., which time is divided into two watches of two hours each, called *dog watches*, by means of which the watches are changed every day, and each watch gets a term of eight hours rest at night. *First watch*, 8 p. m. to midnight; *middle watch*, midnight to 4 a. m.; *morning watch*, 4 to 8 a. m.; *forenoon watch*, 8 a. m. to noon; *afternoon watch*, noon to 4 p. m.; *first dog watch*, 4 to 6 p. m.; *second dog watch*, 6 to 8 p. m. The bell is struck every half-hour to indicate the time, as follows:

1 bell.....	12.30 a. m.	1 bell.....	12.30 p. m.
2 bells.....	1.00 a. m.	2 bells.....	1.00 p. m.
3 bells.....	1.30 a. m.	3 bells.....	1.30 p. m.
4 bells.....	2.00 a. m.	4 bells.....	2.00 p. m.
5 bells.....	2.30 a. m.	5 bells.....	2.30 p. m.

6 bells.....	3.00 a. m.	6 bells.....	3.00 p. m.
7 bells.....	3.30 a. m.	7 bells.....	3.30 p. m.
8 bells.....	4.00 a. m.	8 bells.....	4.00 p. m.
1 bell.....	4.30 a. m.	1 bell.....	4.30 p. m.
2 bells.....	5.00 a. m.	2 bells.....	5.00 p. m.
3 bells.....	5.30 a. m.	3 bells.....	5.30 p. m.
4 bells.....	6.00 a. m.	4 bells.....	6.00 p. m.
5 bells.....	6.30 a. m.	5 bells.....	6.30 p. m.
6 bells.....	7.00 a. m.	6 bells.....	7.00 p. m.
7 bells.....	7.30 a. m.	7 bells.....	7.30 p. m.
8 bells.....	8.00 a. m.	8 bells.....	8.00 p. m.
1 bell.....	8.30 a. m.	1 bell.....	8.30 p. m.
2 bells.....	9.00 a. m.	2 bells.....	9.00 p. m.
3 bells.....	9.30 a. m.	3 bells.....	9.30 p. m.
4 bells.....	10.00 a. m.	4 bells.....	10.00 p. m.
5 bells.....	10.30 a. m.	5 bells.....	10.30 p. m.
6 bells.....	11.00 a. m.	6 bells.....	11.00 p. m.
7 bells.....	11.30 a. m.	7 bells.....	11.30 p. m.
8 bells.....	12.00 n.	8 bells.....	12.00 ngt.

## Board and Timber Measure.—A board one foot square and one inch thick is the unit of board measure, the number of feet in a board being determined by the number of times its volume equals that of the unit:

Thus a board 2 inches thick,  $\frac{1}{2}$  feet wide and 10 feet long contains 30 feet.

A board of the same length and width  $\frac{1}{2}$  inch thick would contain 71 boards of the same length and width.

## The Doyle Rule.—Known in some sections as the Connecticut River Rule, the

Moore & Beman Rule, and the Scribner Rule—is used throughout the entire country and is more generally employed than any other. It is constructed by the following formula: Deduct 4 inches from the diameter of the log as an allowance for slab; square one-quarter of the remainder and multiply the result by the length of the log in feet. It is the usual custom to measure the diameter inside the bark at the small end. One cord of wood is 128 cubic feet.

In metric countries all wood is measured in cubic meters.

Water Measure.—The *Miner's Inch* is usually defined as the quantity of water that will pass through an orifice 1 square inch in cross section under a given head.

The head has been fixed in various localities at from 4 to 61 inches to the center of the orifice. In states where the miner's inch is defined by statute it varies from  $\frac{1}{10}$  to  $\frac{1}{100}$  of a cubic foot per second.

The miner's inch is rapidly becoming obsolete, its place being taken by the cubic foot per second or the gallon per second. The United States reclamation service uses the cubic foot per second.

## Visibility Distance at Sea.—Table of elevations of objects above sea level, with their corresponding distances of visibility.

Height in Feet	Distance in Nautical Miles	Height in Feet	Distance in Nautical Miles
5	2.555	110	11.986
10	3.014	120	12.000
15	4.228	130	13.030
20	5.111	140	13.522
25	5.714	150	13.997
30	6.260	200	16.162
35	6.761	250	18.070
40	7.228	300	19.875
45	7.666	350	21.361
50	8.081	400	22.657
55	8.478	450	24.244
60	8.852	500	25.555
65	9.214	550	26.832
70	9.562	600	27.994
75	9.897	650	29.137
80	10.222	700	30.170
85	10.536	800	32.375
90	10.842	900	34.286
95	11.139	1000	36.140
100	11.428		

**Metric System.**—The unit of length in the metric system is the *meter*, a length originally planned to be equal to the one ten-millionth of the distance between the equator and the pole, measured along a

terrestrial meridian. A platinum bar of this supposed length was constructed and deposited in the archives of the French republic in 1799. At the same time a platinum weight was constructed which was made equal to the mass of a cube of pure water at 4 degrees centigrade, the sides of the cube being one-tenth the length of the meter. This weight, which is equal to one thousand units of mass in the metric system, is called the *kilogram*.

Subsequent geodetic measures showed that the lengths of arcs differ on different parts of the earth and also that the value of the arc from which the meter was derived was in error by about one part in a thousand, causing a similar error in the length of the meter. Nevertheless the length of the original meter bar, known as the meter of the archives, has been retained, although its reference to the quadrant has been abandoned.

In 1875 an international bureau of weights and measures was established near Paris, France, by the concurrent action of the principal nations of the world for the purpose of constructing exact copies of the meter and kilogram deposited in the archives. Thirty-one standard meters of iridium-platinum and forty kilograms of the same alloy were constructed and carefully compared with the standards of the archives and with one another.

**International Prototypes.**—This great work was completed in 1889 and the meter and the kilogram which agreed most nearly with the original standards of the archives were called international prototypes and were deposited at the international bureau, where they are maintained to-day subject to the authority of the international committee on weights and measures.

The remaining meters and kilograms were distributed by lot to the different nations which contributed to the support of the bureau. The United States secured two copies of the meter and two copies of the kilogram, which are in the custody of the bureau of standards at Washington. One of the meters known as No. 27 and one kilogram, No. 40, were selected as the United States standards, while the other meter and kilogram are used as working standards.

**Determinations of the Units.**—The length of the international meter has been determined in terms of the wave lengths of the red, green and blue radiations of cadmium, so that if every meter in the world were destroyed the length could be reproduced within less than one part in ten million. The number of wave lengths of the different radiations at 15 degrees centigrade and 760 millimeters pressure are as follows:

Red 1 m. = 1,553,163.3
Green 1 m. = 1,965,249.7
Blue 1 m. = 2,062,372.1

The unit of capacity in the metric system is the *liter*, which was intended to be both equal to the volume of a cubic decimeter and to the volume of pure water under normal atmospheric pressure and at the temperature of maximum density (4°C.) that would exactly balance one kilogram in vacuo.

**Extent of Use.**—The use of the metric system is obligatory in France, Germany, Austria, Hungary, Belgium, Brazil, Bulgaria, Chili, Colombia, Denmark, Spain, Holland, Italy, Mexico, Montenegro, Peru, Portugal, Argentina, Roumania, Servia, Sweden, Norway, Switzerland, and Uruguay. Also in Cuba, the Philippine Islands, Porto Rico, and Guam. Its use is legal in the United States, Great Britain and possessions, in Russia, Japan, Egypt,





Table I. UNITED STATES LEGAL WEIGHTS (in pounds) PER BUSHEL—Continued

STATE OR TERRITORY	HUNGARIAN GRAIN SEED	MILLET	OATS	ONIONS		ONION GRASS SEED	ONION GRASS SEED	PARSNIPS	PEACHES*			PEANUTS	PEAR		POTATOES	SWEET POTATOES	RAPHSEY SEED	RICE	RUTABAGAS	RYE MEAL	RYE	SHOOTS*	Sorghum SEED	TOMATOES	TURNIP SEED	TURNIPS	WHEAT
				Onions*	Onion Sets				Dried*	Peeled	Dried*		Unshelled														
United States.....	..	..	32	..	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Alabama.....	..	..	32	..	..	..	..	..	..	38	33	..	..	..	60	60	55	..	..	..	56	..	..	..	..	55	60
Arizona.....	..	50	32	..	..	..	..	..	..	33	33	..	..	..	60	60	50	14	..	..	56	..	..	50	60	57	60
Arkansas.....	..	..	32	..	..	..	..	..	..	..	..	..	..	..	60	60	50	..	..	..	56	..	..	..	..	..	60
California.....	..	..	32	..	..	..	..	..	..	..	..	..	..	..	60	60	54	..	..	..	56	..	..	..	..	..	60
Colorado.....	..	..	32	57	..	..	..	45	..	33	33	..	..	..	60	60	54	..	45	60	50	56	20	..	..	50	60
Connecticut.....	..	..	32	..	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Delaware.....	..	..	32	..	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
District of Columbia.....	..	..	32	..	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Florida.....	..	50	32	56	..	..	..	..	..	54	33	..	..	..	60	60	..	..	..	..	56	..	56	..	54	60	60
Georgia.....	..	..	32	57	..	..	..	..	..	38	33	..	..	..	60	60	55	..	43	..	56	..	..	..	45	55	60
Hawaii.....	..	..	32	..	..	..	..	..	..	..	..	22	60	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Idaho.....	..	..	32	..	..	..	..	..	..	..	..	43	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Illinois.....	..	..	32	57	..	..	..	..	..	..	..	..	..	..	60	60	50	..	..	..	56	..	..	..	45	55	60
Indiana.....	..	..	32	57	..	14	33	55	..	..	..	..	..	..	60	60	46	..	..	..	56	..	..	..	..	..	60
Iowa.....	50	50	30	32	57	..	..	32	..	45	..	..	..	..	60	60	55	..	..	..	56	..	30	..	45	60	60
Kansas.....	50	50	30	32	57	..	..	..	..	..	..	..	..	..	60	60	50	..	..	..	56	..	56	..	45	55	60
Kentucky.....	50	50	30	32	57	36	14	..	..	39	..	..	..	..	60	60	55	..	..	..	56	..	..	45	60	60	60
Louisiana.....	..	..	32	52	..	..	..	..	45	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Maine.....	..	..	32	52	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Maryland.....	..	..	32	52	..	..	..	..	..	..	..	..	..	..	60	60	56	..	..	..	56	..	..	..	..	..	60
Massachusetts.....	..	50	32	62	..	..	..	..	..	..	..	..	..	..	60	60	54	..	45	50	56	20	..	60	..	45	60
Michigan.....	..	50	30	32	54	14	33	..	..	..	..	..	..	..	60	60	56	14	..	..	56	..	57	45	58	60	60
Minnesota.....	..	..	30	32	52	..	..	42	..	28	33	..	..	..	60	60	54	..	52	..	56	..	..	..	..	..	60
Mississippi.....	45	50	30	32	57	..	..	..	..	..	..	..	..	..	60	60	50	..	..	..	56	..	42	45	55	60	60
Missouri.....	45	50	30	32	57	25	11	36	44	45	33	..	45	56	60	60	56	14	..	50	..	56	..	..	..	..	60
Montana.....	..	..	30	32	57	..	..	..	..	..	..	..	..	..	60	60	50	..	..	..	56	..	..	..	..	..	60
Nebraska.....	50	50	30	32	57	28	11	..	..	..	..	..	..	..	60	60	50	..	..	..	56	..	30	..	45	55	60
New Hampshire.....	..	..	32	..	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
New Jersey.....	..	..	30	57	..	..	..	..	..	..	..	..	..	..	60	60	54	..	..	..	56	..	..	..	..	..	60
New York.....	..	..	32	57	..	..	..	..	..	..	..	..	..	..	60	60	54	..	45	50	56	20	..	45	..	..	60
North Carolina.....	..	..	32	..	..	..	..	..	..	..	..	22	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
North Dakota.....	..	50	30	32	57	..	..	..	..	..	..	..	..	..	60	60	46	..	..	..	56	..	..	45	60	60	60
Ohio.....	50	50	32	55	..	..	..	..	..	48	33	..	..	..	60	60	50	..	..	..	56	..	..	56	45	60	60
Oklahoma.....	..	..	32	52	..	..	..	..	..	..	..	..	..	..	60	60	46	..	..	..	56	..	..	..	..	..	60
Oregon.....	..	..	32	..	..	..	..	..	..	..	..	..	45	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Pennsylvania.....	..	..	32	50	..	..	..	..	..	..	..	..	..	..	60	60	56	..	..	..	56	..	..	..	..	..	60
Rhode Island.....	..	50	30	32	50	..	..	..	..	50	48	33	..	..	60	60	54	..	..	..	56	20	..	56	45	60	60
South Carolina.....	..	..	32	52	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
South Dakota.....	..	..	32	56	..	23	14	33	50	50	26	..	23	56	30	60	50	14	..	..	56	..	50	56	45	60	60
Tennessee.....	48	50	30	32	57	..	..	..	..	..	..	..	..	..	60	60	55	..	..	..	56	..	..	..	45	58	60
Texas.....	48	50	30	32	57	..	..	..	..	..	..	..	..	..	60	60	55	..	..	..	56	..	..	..	45	60	60
Vermont.....	..	..	30	32	52	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Virginia.....	45	50	30	32	57	28	14	34	..	..	..	40	32	22	..	60	56	56	12	..	..	56	..	..	45	55	60
Washington.....	..	..	32	..	..	..	..	..	..	..	..	..	..	45	..	60	60	..	..	..	56	..	..	..	..	..	60
West Virginia.....	..	..	32	..	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	56	..	..	..	..	..	60
Wisconsin.....	48	50	32	57	..	..	..	..	44	..	33	..	..	..	60	60	54	..	45	56	50	50	20	..	45	42	60

\* Not defined.

† Small white beans, 60 pounds.

‡ Green apples.

§ Sugar beets and mango-wurzel.

|| Shelled beans 60 pounds; velvet beans, 78 pounds.

¶ White beans.

/ Wheat bran.

\* Corn in ear, 70 pounds until December 1st next after growth; 68 pounds thereafter.

† English blue-grass seed, 22 pounds; native blue-grass seed, 14 pounds.

‡ Rice corn.

/ Corn in ear from November 1st to May 1st following, 70 pounds; 68

pounds from May 1st to November 1st.

\* Soy beans, 56 pounds.

† Cracked corn, 50 pounds.

‡ Green unshelled beans, 30 pounds.

§ Canals coal, 70 pounds.

|| Standard weight in borough of Greensburg, 75 pounds.

¶ Dried beans; green unshelled beans, 30 pounds.

/ Red and white.

\* Unwashed plastering hair, 8 pounds; washed plastering hair, 4 pounds.

Table II. COMMODITIES FOR WHICH THE LEGAL WEIGHTS PER BUSHEL HAVE BEEN FIXED IN BUT ONE OR TWO STATES

ARTICLE	WEIGHT	STATES	ARTICLE	WEIGHT	STATES
Blackberries.....	32	Iowa, Tennessee, 48 pounds; dried, 28 pounds.	Lead plaster.....	100	Tennessee.
Cherries.....	40	Minnesota.	Mustard.....	30	Tennessee.
Cornary seed.....	42	Tennessee.	Plums.....	40	Florida, Tennessee, 64 pounds.
Cantaloupe melon.....	50	Tennessee.	Plums, dried.....	28	Michigan.
Corn.....	60	Tennessee.	Popcorn.....	70	Indiana and Tennessee. Ohio, in the ear, 42 pounds.
Cherries.....	40	Iowa, Tennessee, with stems, 56 pounds; without stems, 64 pounds.	Prunes, dried.....	28	Idaho; green, 45 pounds.
Chestnuts.....	50	Tennessee, Virginia, 57 pounds.	Quinces.....	45	Florida, Iowa, and Tennessee.
Cotton seed, staple.....	42	South Carolina.	Rape seed.....	50	Wisconsin.
Cucumbers.....	48	Missouri and Tennessee, Wisconsin, 50 pounds.	Raspberries.....	32	Kansas, Tennessee, 48 pounds.
Curnis.....	40	Iowa and Minnesota.	Rhubarb.....	50	Tennessee.
Grapes.....	40	Iowa, Tennessee, with stems, 48 pounds; without stems, 60 pounds.	Salads.....	30	Tennessee.
Hickory nuts.....	50	Tennessee.	Sand.....	130	Iowa.
Honey.....	60	Ohio, Tennessee, 62 pounds.	Spinach.....	30	Tennessee.
Horse-radish.....	50	Tennessee.	Strawberries.....	32	Iowa, Tennessee, 48 pounds.
Kaffir corn.....	40	Tennessee.	Sugar-cane seed.....	57	New Jersey.
Kale.....	30	Tennessee.	Velvet-grass seed.....	7	Tennessee.
			Walnuts.....	50	Tennessee.

**Foreign Weights and Measures.**—Japan.—In Japan the kwan, equal to 3.75 kilograms or 8.28 pounds avoirdupois, is the unit of mass. It is divided into 1,000 mommes, the mommes into 10 fuus and the fuu into 10 rins, the rin into 10 mos, and the mo into 10 shis.

The unit of length is the shaku, equal

to  $\frac{10}{33}$  (0.30303) meter, or 0.9941919 United States ftwt. The shaku is decimally divided into sun, bu, rin, mo, and shi. Multiples of the shaku are the ken, equal to 6 shaku; the cho, equal to 60 ken, and the pi, equal to 36 cho, or 12,960 shaku.

The shaku (land measure) is equal to 0.00033 acre, or 0.988417534 square foot,

10 shaku equal 1 go and 10 go equal 1 bu or tsubo, 30 bu equal 1 se, 10 se equal 1 tan, and 10 tan 1 cho.

The shaku (capacity measure) equals 0.01806 liter, or 0.180616 United States liquid quart, 10 shakus equal 1 go, 10 go 1 sho, 10 shos 1 to, and 10 tos 1 koku. The metric weights and measures are



TABLE OF FOREIGN WEIGHTS AND MEASURES—Continued

DENOMINATIONS	WHERE USED	AMERICAN CUSTOMARY EQUIVALENTS
Sho. . . . .	Japan. . . . .	1.6 liquid quarts
Standard (St. Petersburg). . . . .	Japan. . . . .	165 cubic feet
10. . . . .	Uruguay. . . . .	1.193 inches
Surte. . . . .	Uruguay. . . . .	2.700 cuadras (see cuadras)
Sun. . . . .	Japan. . . . .	590.75 grains (troy)
Tael. . . . .	Cochin China. . . . .	0.25 acre 9,884 sq. ft.
Tan. . . . .	Japan. . . . .	2 pecks
Ton. . . . .	Spain. . . . .	40 cubic feet
Tons (carrals). . . . .	Denmark. . . . .	3.94783 bushels
Tondal. . . . .	Denmark. . . . .	1.36 acres
Traub. . . . .	Japan. . . . .	98.84 square feet
Trun. . . . .	China. . . . .	1.26 inches
Tuna. . . . .	Sweden. . . . .	4.5 bushels
Tunaland. . . . .	Sweden. . . . .	1.22 acres
	Argentine Republic. . . . .	34.1208 inches
	Central America. . . . .	32.67 inches
	Chile and Peru. . . . .	33.367 inches
	Cuba. . . . .	33.375 inches
	Curaçao. . . . .	33.375 inches
	Mexico. . . . .	33 inches
	Panama. . . . .	33.364 inches
	Spain. . . . .	0.91417 yard
	Venezuela. . . . .	33.384 inches
	Russia. . . . .	71.9 inches
	Isle of Jersey. . . . .	244 square rods
	Russia. . . . .	0.6029 mile
	Russian Poland. . . . .	41.95 acres

Although the metric weights are used officially in Spain, the Castile quintal employed in commerce in the peninsula and colonies, save in Catalonia, the Catalan quintal equals 91.71 pounds.

## WEIGHTS AND MEASURES OF THE BIBLE

WEIGHTS		Troy.	
Avoirdupois		Lbs.	Oz.
A gerah. . . . .	0	0	0.439
10 gerahs = 1 shekel. . . . .	0	0	4.39
2 shekels = 1 shekel. . . . .	0	0	8.78
60 shekels = 1 maneh. . . . .	2	0	14.628
360 manehs = 1 talent. . . . .	10	12	11.428
MEASURES		Feet	
LONG MEASURES		Feet	Inches
A digit, or finger (Jer. li, 21). . . . .	0	0	0.912
4 digits = 1 palm (Exod. xxviii, 17). . . . .	0	0	3.65
3 palms = 1 span (Exod. xxviii, 16). . . . .	0	0	10.944
2 spans = 1 cubit (Gen. vi, 9). . . . .	1	0	1.888
4 cubits = 1 fathom (Acts xxviii, 28). . . . .	4	0	7.552
1.8 fathoms = 1 reed (Exek. xl, 5). . . . .	10	11	11.328
13.3 reeds = 1 line (Exek. xl, 5). . . . .	145	11	11.04
LIQUID MEASURES		Feet	Pints
A eubit. . . . .	0	0	1.824
400 eubits = 1 furlong (Luke xiv, 19). . . . .	0	145	4.6
5 furlongs = 1 seah day's journey (Job. xli, 18). . . . .	0	727	3.0
10 furlongs = 1 mile (Matt. v, 41). . . . .	1	399	1.0
24 miles = 1 day's journey. . . . .	33	76	4.0
LIQUID MEASURES		Gallons	Pints
A eaph. . . . .	0	0	0.625
13 eaphs = 1 log (Lev. xiv, 10). . . . .	0	0	8.333
4 logs = 1 eab. . . . .	0	0	3.333
3 eabs = 1 hin (Exod. xxi, 24). . . . .	1	2	4.5
2 hins = 1 eab. . . . .	2	4	4.5
3 eabs = 1 bath, or ephah (1 Kings vi, 26; John ii, 6). . . . .	3	6	4.5
10 ephahs = 1 kor, or homer (Isa. v, 10; Exek. xiv, 14). . . . .	75	5.25	

**Time.**—Three kinds of time are recognized by astronomers, viz., sidereal, apparent solar and mean solar time.

**Sidereal Time.**—The sidereal day is the interval between two consecutive transits of a given fixed celestial object across any given meridian, or it is the interval required by the earth to make one complete revolution on its axis. This interval is constant but it is inconvenient as a time unit because the noon of the sidereal day occurs at all hours of the day and night.

**Apparent Solar Time.**—The apparent solar day is the interval between two consecutive transits of the sun across any given meridian. On account of the variable distance between the sun and earth, the variable speed of the earth in its orbit, the effect of the moon, etc., this interval is not constant and consequently cannot be kept by any simple mechanism, such as a clock or watch.

**Mean Solar Time.**—To overcome the objection noted above, the mean solar day was devised. The mean solar day is the length of the average apparent solar day. Like the sidereal day it is constant, and like

the apparent solar day its noon always occurs at approximately the same time of day.

The sidereal or astronomical day begins at mean noon and the hours run from one to twenty-four, while the civil day (mean solar) begins twelve hours earlier, at midnight, and the hours run from one to twelve, and then repeat from noon to midnight. The hours are in both cases divided into sixty minutes, and the minutes into sixty seconds.

**The Year.**—In dealing with longer periods, such as the life of a man, the day is not small a period, and for all chronological purposes the year has always been employed.

There are three different kinds of year used—the sidereal, the tropical, and the anomalistic.

**The Sidereal Year** is the time taken by the earth to complete one revolution around the sun from a given star to the same star again. Its length is 365 days 6 hours 9 minutes 9 seconds.

**The Tropical Year** is the time included between two successive passages of the

## WEIGHTS AND MEASURES OF THE BIBLE—Continued

DRY MEASURES		Pcks	Gallons	Pints
A gachal. . . . .	0	0	0	0.1410
20 gachals = 1 eab (2 Kings vi, 25; Rev. vi, 6). . . . .	0	0	0	2.8333
1 eab = 1 omek (Matt. xiii, 53). . . . .	0	0	0	8.1
3.3 omers = 1 eab (Matt. xiii, 53). . . . .	0	0	0	3
3 seahs = 1 ephah (Exek. xiv, 11). . . . .	3	0	0	3
5 ephahs = 1 ephah (1 Kings vi, 26). . . . .	5	0	0	0
2 ephahs = 1 kor, or homer (Num. xii, 37; Hos. iii, 2). . . . .	10	0	0	0

N. B.—The foregoing table will explain many texts in the Bible. Take, for instance, Isa. l, 10. "Yes, ten acres of vineyard shall yield one bath, and the seed of an homer shall yield an ephah." This curse upon the covetous man was that 10 acres of vines should produce only 7 gallons of wine, i. e., one acre should yield less than 3 quarts; and that 32 pecks of seed should only bring a crop of 3 pecks, or, in other words, that the harvest reaped should produce but one-tenth of the seed sown.

### TIME

The natural day was from sunrise to sunset.  
The natural night was from sunset to sunrise.  
The civil day was from sunset on one evening to sunset the next; for, "the evening and the morning were the first day."

### NIGHT (Ancient)

First watch (Lev. xix, 19), till midnight. . . . .	Morning till about 10 a. m.
Middle watch (Judg. vii, 19), till 3 a. m. . . . .	Heat of day till about 2 p. m.
Morning watch (Exod. xiv, 24), till 6 a. m. . . . .	Cool of day till about 6 p. m.

### NIGHT (New Testament)

First watch, evening = 6 to 9 p. m. . . . .	Third hour = 6 to 9 a. m.
Second watch, midnight = 9 to 12 p. m. . . . .	Sixth hour = 9 to 12 midday.
Third watch, cock-crow = 12 to 3 a. m. . . . .	Ninth hour = 12 to 3 p. m.
Fourth watch, morning = 3 to 6 a. m. . . . .	Twelfth hour = 3 to 6 p. m.

## JEWISH MONEY

With its value in English and American money; the American dollar being taken as equal to 4s. 2d.

English		American	
pounds s. d.		Dols. Cts.	
A gerah (Exod. xxi, 13). . . . .	0	0	0.7
10 gerahs = 1 shekel (Exod. xxviii, 20). . . . .	0	1	1.85
2 shekels = 1 shekel (Exod. xxi, 13). . . . .	0	2	3.7
50 shekels = 1 maneh. . . . .	0	14	25.5
60 manehs = 1 kikkar (talent). . . . .	342	3	9
A gold shekel. . . . .	0	0	70
A kikkar of gold. . . . .	5,475	0	26,380
N. B.—A shekel would probably purchase nearly ten times as much as the same nominal amount will now. Remember that one Roman penny (s'd.) was a good day's wages for a laborer.			
The Hebrew maneh, according to 1 Kings x, 17, compared with 2 Chron. ii, 16, contained 100 shekels; though according to one interpretation of Exek. xiv, 11, it contained 60, but more probably 50. The passage reads thus: "Twenty shekels, five and twenty shekels, fifteen shekels shall be your maneh." This is variously interpreted: (1) 20+25+5 = 50; (2) 20, 25, 5 are different kinds of gold, silver, and copper, bearing the same name. It is well to refer the meaning of these names: Shekel simply, weight; Bekah = split, i. e., the shekel divided into two; Gerah = grain, as in our currency, a grain and a half, the original standard weight; Maneh appointed; Maneh appointed, to sterling, a specific sum; Kikkar = round mass of metal, i. e., a weight or coin. Hebrew names in the Bible are not the same as the names in the Bible, as shown in Luke xii, 13, is Greek, though possibly identical with the Hebrew maneh.			

## ROMAN MONEY

English		American	
pounds s. d.		Dols. Cts.	
A "farthing," quadrans (Matt. v, 26) = nearly. . . . .	0	1	25
A "farthing," as in 4 quadrans (Matt. x, 29) = nearly. . . . .	0	5	1
A "denarius," 16 asses (Matt. x, 29) = nearly. . . . .	0	1	17
The Roman sestertius = 24 asses, is not named in the Bible.			
N. B.—Here we learn that:—			
Naaman offering to Elisha of 5,000 pieces (shekels) of gold amounted to more than £10,000 = 48,000 dollars.			
The Debtor (Matt. xviii, 24), who had been forgiven 10,000 talents, i. e., £3,000,000 = 14,000,000 dollars, refused to forgive his fellow-servant 100 pence, i. e., £3 10s. 10d = 17 dollars.			
Judas sold our Lord for 30 pieces of silver, i. e., £3 10s. 8d = 16 dollars 96 cents, the legal value of a slave, if he were killed by a beast.			
Joseph was sold by his brethren for 20 pieces, i. e., £2 7s. = 11 dollars 28 cents.			

vernal equinox by the sun, and since the equinox moves westward 50.2 seconds of arc a year the tropical year is shorter by 20 minutes 23.5 seconds in time than the sidereal year. As the seasons depend upon the earth's position with respect to the equinox, the tropical year is the year of civil reckoning.

**Anomalistic Year.**—The third kind of year is the anomalistic year—the interval between two successive passages of the perihelion, namely, the time of the earth's nearest approach to the sun. The anomalistic year is not used in special calculations in astronomy.

**The Calendar.**—Various attempts were made by the ancients to reconcile the month, which originally depended upon the changes of the moon, with the tropical year, but a satisfactory solution is not possible, and the calendars of civilized nations now disregard the moon entirely. The Mohammedan nations, however, still use a lunar calendar with a year of twelve lunar months, which alternately contain 355 and 356 days. According to their method of reckoning the same month falls

in different seasons, and their calendars gain one day on ours every thirty-three years. The *Julian Calendar*, which was established 45 B. C., by Julius Caesar, discarded all consideration of the moon and adopted 365½ days as the true length of the year. He ordained that every fourth year should contain 366 days, and transferred the beginning of the year from March to January 1. The Julian calendar is still used in Russia and generally by the Greek church. The *Gregorian Calendar*.—The true length of the tropical year is not 365½ days, but 365 days 5 hours 48 minutes 45.5 seconds, a difference of 11 minutes 14.5 seconds by which the Julian year is too long. This amounts to a little more than three days in four hundred years, and consequently the date of the vernal equinox had in Pope Gregory's time fallen back to March 11th instead of occurring on March 21st as it did at the Council of Nice, A. D. 325. This pope therefore decreed that the calendar should be corrected by dropping ten days, so the day following October 4, 1582, should be called October 15th instead of October 5th, and also in the future only such century years shall be leap years as are divisible by 400. Thus 1700, 1800, 1900, etc., are not leap years, while 1600, 2000, 2400, etc., are. The change was immediately made in all Catholic countries, but it was not until 1752 that the Gregorian calendar was adopted by England.

**Standard Time.**—Prior to 1883 each city had its own time, which was determined by the time of passage of the sun across the local meridian. Consequently the traveler going from one city to another had to continually change his watch to the local time. Largely through the efforts of the railroads a system of standard time was introduced. According to this system the United States, which extends from 65 degrees to 125 degrees west longitude, was divided into four sections, each of 15 degrees longitude.

The first (or eastern) section includes all territory between the Atlantic coast and an irregular line drawn from Detroit, Mich., through Pittsburg to Charleston, S. C., its most southern point. The time of this section is that of the 75th meridian, which is five hours slower than Greenwich time.

The second (central) section includes all territory between the line mentioned and an irregular line drawn from Bismarck, N. D., to the mouth of the Rio Grande.

The third (mountain) section includes all territory between the last-named line and a line which passes through the western part of Idaho, Utah and Arizona.

The fourth (Pacific) section covers the rest of the country to the Pacific Ocean. Standard time is uniform in each of these sections, but the time in one section differs by exactly one hour from the section next to it. Thus the time of the first section is five hours slower than Greenwich time, the time of the central section six hours slower, the time of the mountain seven hours, and the time of the Pacific section is eight hours slower than Greenwich mean time.

In cities situated on the border line of two sections, as, for instance, Pittsburg and Atlanta, the standard time of both sections are used; for example, if at Pittsburg it is 7 a. m. eastern time, it is 6 a. m. central time, and in such cities when the time is given, it should be specified as eastern, central, etc.

The system of standard time has been practically adopted in almost all civilized countries. All continental Europe, except

Russia, uses a time one hour faster than that of Greenwich; in Japan and Australia the time is nine hours faster, etc.

**Temperature Scales.**—Temperature is the term used to designate the state of a body as regards hotness or coldness. Two bodies are said to have the same temperature if, when they are put in contact, there is no tendency for one to get hotter while the other gets colder; if there is such a tendency, the one which tends to cool off is said to have the higher temperature. A *Scale of Temperature* is a system of numbering temperatures, the numbers being larger as the temperatures are higher. Such scales are based upon two fixed temperatures, viz., the "ice-point" or temperature at which pure ice melts, and the "steam point" or temperature at which pure water boils, both under the standard barometric pressure of 760 millimeters or 29.92 inches of mercury. Three such systems or scales are in use—the centigrade or Celsius, the Fahrenheit, and the Reaumur.

**Centigrade.**—On the centigrade scale, which is used almost universally in countries which have adopted the metric system of weights and measures, as well as in scientific work everywhere, the ice-point is numbered zero degrees (0° C.), and the steam-point one hundred degrees (100° C.), the unit of measurement, or the centigrade degree (1° C.) being the one-hundredth part of this interval.

**Fahrenheit.**—On the Fahrenheit scale, which is generally used in English-speaking countries, except among scientific men, the ice-point is numbered 32° F., and the steam-point 212° F., the difference being 180°, and the Fahrenheit degree (1° F.) being the one-hundred-eightieth part of this interval. The Fahrenheit degree is thus  $\frac{180}{100}$  or  $\frac{9}{5}$  as large as the centigrade degree. The Fahrenheit zero, at 32° below the ice-point, corresponding to  $-2^{\circ} \times 32 = -17.8^{\circ}$ , is approximately the lowest temperature that can be obtained with ordinary freezing mixtures of ice and common salt.

**Reaumur.**—The Reaumur scale is used in a few European countries, but is fast being superseded by the centigrade. It has 0° at the ice-point and 80° at the steam point, so that the Reaumur degree (1° R.) is  $\frac{2}{5}$  of the centigrade degree or  $\frac{3}{4}$  of the Fahrenheit degree.

**Conversion.**—To convert from one scale to another we have, in accordance with the above definitions, the following practical rules: Centigrade to Fahrenheit; multiply by  $\frac{9}{5}$  and add 32°.

Centigrade to Reaumur; multiply by  $\frac{4}{5}$ . Fahrenheit to centigrade; subtract 32° and multiply by  $\frac{5}{9}$ .

Fahrenheit to Reaumur; subtract 32° and multiply by  $\frac{4}{5}$ . Reaumur to Fahrenheit; multiply by  $\frac{5}{4}$  and add 32°.

Care should be taken to make the addition or subtraction algebraically, i. e., taking account of the negative sign when the temperature in question is below zero.

**Absolute Temperature.**—By the absolute temperature of a body is meant its temperature, measured in either of the three kinds of degrees, not from the ice-point or from the Fahrenheit zero, but from a point known as the absolute zero, which is at about  $-273.1^{\circ}$  C. or  $-459.6^{\circ}$  F. or  $-218.5^{\circ}$  R. This

mode of numbering temperatures is frequently convenient in scientific and engineering work. To convert centigrade temperatures into centigrade-absolute temperatures add 273.1°.

To convert from Fahrenheit to Fahrenheit-absolute add 459.6°. To convert from Reaumur to Reaumur-absolute add 218.5°. To convert in the other direction, subtract the same amounts. The Reaumur-absolute scale is seldom or never used, and the Fahrenheit-absolute scale only by engineers in English-speaking countries. When the term "absolute temperature" is used without further qualification, it usually means the centigrade temperature plus 273.1°, though this value, which may also be looked upon as the centigrade-absolute temperature of the ice-point, is sometimes taken as high as 274°.

**Barometric Measurements.**—By barometer reading is meant the height in inches or millimeters of the column of mercury, under standard conditions, that exactly balances the pressure exerted by the atmosphere at the instant the reading is made. The pressure exerted by a given column of mercury depends upon the altitude of the barometer, and upon the latitude, and it is customary, in order to get accurate comparisons, to refer the readings to latitude 45°, and to sea level. Also since the density of the mercury is affected by the temperature it is usually referred to 0° centigrade.

Since all air movements are the result of difference in pressure, important conclusions regarding the weather to be expected may be deduced from barometric readings, hence their use by mariners and weather experts.

Their value in determining altitudes depends upon the fact that the pressure of the atmosphere decreases with the altitude according to a fairly well established law, which is illustrated by the following table:

PRESSURE OF THE ATMOSPHERE AT DIFFERENT ELEVATIONS

Elev. Feet	Barom. Inches	Elev. Feet	Barom. Inches	Elev. Feet	Barom. Inches
0	29.92	600	29.25	4000	25.81
50	29.845	700	29.14	5000	24.88
100	29.79	800	29.03	6000	23.98
200	29.68	900	28.92	7000	23.11
300	29.57	1000	28.82	8000	22.28
400	29.46	2000	27.78	9000	21.48
500	29.35	3000	26.78	10000	20.70

**Beaufort's Wind Scale.**—The Beaufort Scale is used by seamen for recording the force of wind. For the guidance of those unaccustomed to its use, the corresponding velocity per hour in statute miles and in nautical miles is added. The force of wind varies from 0, a calm, to 12, a hurricane.

INTENSITY OR FORCE OF WIND

INTENSITY OR FORCE OF WIND	VELOCITY Statute Nautical miles per hour per hour
0. Calm. "Full raged ship, all sail set, no headway."	0 to 3 to 2.6
1. Light Air. Just sufficient to give motion to smoke.	8 6.9
2. Light Breeze. Speed of 1 or 2 knots, "full and by."	13 11.3
3. Gentle Breeze. Speed of 3 or 4 knots, "full and by."	18 15.6
4. Moderate Breeze. Speed of 5 knots, "full and by."	23 20.0
5. Fresh Breeze. All plain sail, "full and by."	28 24.3
6. Strong Breeze. Topsails set over single-reefed topsails.	34 29.5
7. Moderate Gale. Double-reefed topsails.	40 34.7
8. Fresh Gale. Triple-reefed topsails or reefed upper topsails and courses.	48 41.6
9. Strong Gale. Close-reefed topsails and courses (or lower topsails and courses).	56 48.6



## ELECTRICAL UNITS

NAME	SYMBOL	UNIT OF	HOW OBTAINED	CGS*	EQUIVALENT
Ohm.....	R	Resistance	The electrical resistance of a column of mercury 100 centimeters long and of 1 square millimeter section, at that current of electricity that decomposes 0.0026521 gram of water per second.	10 <sup>9</sup>	1 true ohm = 1.0112 British Association ohms.
Ampere....	C	Current	One ampere of current passing through a substance having 1 ohm of resistance = 1 volt.	10 <sup>9</sup>	Deposits 1.118 milligrams of silver per second.
Volt.....	E	Electromotive force	A current of 1 ampere during 1 second of time.	10 <sup>9</sup>	0.025 of a standard Daniel cell.
Coulomb....	Q	Quantity	The capacity that a current of 1 ampere for 1 second (= 1 coulomb) charges it to potential of 1 volt.	10 <sup>9</sup>	Deposits 1.118 milligrams of silver.
Farad.....	K	Capacity	The capacity that a current of 1 ampere for 1 second (= 1 coulomb) charges it to potential of 1 volt.	10 <sup>9</sup>	2.5 knots of D. U. S. cable.
Watt.....	P	Power	The power of 1 ampere current passing through resistance of 1 ohm.	10 <sup>7</sup>	0.0013405 (or 1/746) of a horsepower.
Joule.....	WJ	Work	The work done by 1 watt of electrical power in 1 second.	10 <sup>7</sup>	0.238 unit of heat (Therm).

\*CGS—Electro-magnetic units.

**Specific Gravity.**—By the specific gravity of a body is usually meant the ratio of the mass of the body to an equal volume of water at some standard temperature. At the present time 4 degrees centigrade is almost exclusively used, although much important older data is given in terms of water at other temperatures, such as 15 degrees centigrade, 20 degrees centigrade and 62 degrees Fahrenheit, etc. Also the specific gravity of gases is frequently expressed in terms of hydrogen.

The density of a body is its mass per unit volume. If the gram is used as the unit of mass and the cubic centimeter as the unit of volume, the density of a body is the same as its specific gravity referred to water at 4 degrees centigrade.

The following table gives the specific gravity or density of some of the more common substances:

## DENSITIES OF MISCELLANEOUS SOLIDS

SUBSTANCE	DENSITY (Grams per Cubic Centimeter)
Aluminum, cast.....	2.59 - 2.55
Aluminum, wrought.....	2.65 - 2.80
Ash wood.....	0.56 - 0.84
Asph.....	0.65 - 0.85
Burch.....	0.51 - 0.77
Brass (yellow, 70 Cu + 30 Zn, Cast).....	8.44
Brick.....	2.0 - 2.2
Cedar.....	0.49 - 0.57
Cherry.....	0.70 - 0.90
Coal, anthracite.....	1.2 - 1.5
Coal, bituminous.....	0.22 - 0.28
Cork.....	0.80 - 0.95
Copper, wrought.....	8.85 - 8.95
Copper, liquid.....	8.217
Gold, cast.....	19.30 - 19.34
Gold, wrought.....	19.33 - 19.34
Glass, flint.....	2.9 - 4.5
Glass, common.....	2.4 - 2.8
Hickory.....	0.60 - 0.93

## DENSITIES OF MISCELLANEOUS SOLIDS—Continued

SUBSTANCE	DENSITY (Grams per Cubic Centimeter)
Ice.....	0.91
Iridium.....	21.78 - 22.42
Iron, wrought.....	7.80 - 7.80
Iron, grey, cast.....	7.03 - 7.13
Lead, cast.....	11.340 - 11.340
Limestone.....	2.40 - 2.80
Lucite.....	0.97 - 1.21
Mahogany.....	0.50 - 0.85
Maple.....	0.62 - 0.75
Marble.....	0.5 - 2.8
Nickel.....	8.20 - 8.90
Oak.....	0.60 - 0.90
Opal.....	2.2
Paraffin.....	0.87 - 0.91
Platinum.....	21.2 - 21.7
Podiat.....	0.25 - 0.70
Silver, cast.....	10.4 - 10.5
Silver, wrought.....	10.50 - 10.57
Steel.....	7.8 - 7.7
Sycamore.....	0.40 - 0.60
Teak, Indian.....	0.66 - 0.88
Teak, African.....	0.98
Tin, wrought.....	7.300
Walnut.....	0.64 - 0.70
Willow.....	0.40 - 0.60
Zinc, wrought.....	7.190

## DENSITY OF LIQUIDS

SUBSTANCE	DENSITY (Grams per Cubic Centimeter)
Alcohol, ethyl.....	0.791
Alcohol, methyl.....	0.810
Chloroform.....	1.480
Ether.....	0.736
Gasoline.....	0.68
Kerosene, 70° F.....	0.79
Mercury.....	13.596
Oil.....	0.918
Petroleum.....	0.878
Sea water.....	1.025
Turpentine.....	0.875

## DENSITY OF GASES

SUBSTANCE	DENSITY (Grams per Cubic Centimeter)
Acetylene.....	0.00118
Carbon dioxide.....	0.001974
Chlorine.....	0.003132
Hydrogen.....	0.000090
Hydrogen sulphide.....	0.001176
Nitrogen.....	0.001251
Oxygen.....	0.001430



## FINE ARTS AND RELIGION

**FINE ARTS.**—This term is generally applied to those arts in which the artist seeks chiefly to give pleasure by the immediate impression produced on the mind by his work. These arts are thus distinguished from arts which are designed to answer some practical purpose, and so have been termed *useful*. By some, the term *fine arts*, which is generally taken to include those which appeal to the eye and ear alike, has been limited to the arts of painting, sculpture, architecture, and music.

The minor fine arts may be defined as those domestic and industries which add to the quality of usefulness certain elements of pleasure and beauty, such as embroidery, ceramics, glassmaking, goldsmiths' work, jewelry, and cabinet-makers' work. Poetry, dancing, acting, and studied eloquence, inasmuch as they are related, are classed as fine arts.

**Antique Arts.**—In its general acceptance the term *antique art* is understood to be that

of a period antecedent to the revival of the classical studies in western Europe, or before renaissance of the arts from their assumed period of lethargy. There was, in fact, a distinct character about the productions of the artists of the more ancient and the more modern times, which was sufficiently marked to produce in the best of them a separate style of art, and which has led to the establishment of the schools of the so-called antique and modern styles; the medieval arts form, as it were, an intermediate class, which was as distinctly marked as any of the other styles. The antique school was distinguished by an anthropomorphic and a divinization of the human form. Medieval Art was formed upon, and characterized by, a species of contempt for the human figure, and an aspiration after an ideal perfection, and therefore there is something vague and undefined in its efforts to represent the objects it copied.

Modern Art has united the indefiniteness of its aim with that clearness of the perception of its objects which is so marked a characteristic of its productions.

The antique schools date from the dawn of civilization to the end of the tenth century; the medieval schools date from the tenth to the fifteenth century; and the modern schools have continued the traditions of the masters of art to the present time.

**Architecture.**—The art of building or constructing is coeval with the earliest dawn of civilization, and may be said to present largely the history of the human family written in stone, brick, or other durable material. In process of its growth it came to be classed under five different heads or orders—the Tuscan, the Doric, the Ionic, the Corinthian and the Composite. These orders progress in ornamentation from the Tuscan, which is the most ancient and severe, to the Corinthian and the Composite, which are the more florid. There are, besides these, various styles of architecture, such as the Gothic, the Moorish, etc., but these are not classed as orders, being styles merely.

Architecture is divided into three classes—civil, military, and naval. Civil architecture, when taken in the widest sense, may be regarded either from an artistic, a scientific, or a utilitarian point of view. In the first case, as a means of giving external form and sensible expression to mental conceptions or ideas, it is a branch of aesthetics, or of the fine arts properly so called, and takes rank with sculpture and painting; in the second case it consists in a knowledge of certain laws of physical nature and a power of raising them into play or counteracting their operation, and is consequently a branch of that wider department of science to which the name of mechanics is given; whereas in the last it becomes a practical art, which has for its object the application of the principles, both artistic and scientific, which architecture embraces, to the elevation of national and individual character and the increase of the physical comfort and well-being of mankind.

The abstract conception of an all-pervading deity as embodied in the Greek temple, the religious aspirations after a personal God as shadowed forth in the Gothic cathedral, can be realized only in accordance with the principles of mechanics and the most rigorous adaptation of means to ends; whereas, in the opposite direction, the grand of the Hottentot, the hut of the Indian in the American wilderness, or

even the vulgar chimney-stalk in the dingy manufacturing suburb, if properly constructed for their respective purposes, will be found to have obeyed such æsthetic principles as they may have come in contact with.

Though a strict adherence to all the principles of architecture be indispensable to every genuine architectural structure, whatever be its object, it by no means follows that equal prominence must be given to each of these principles on every occasion. If a building has for its primary object the expression and commemoration of such feelings as grief, gratitude, devotion, or the like, this object manifestly will be best attained by subordinating the scientific and utilitarian to the æsthetic principles of architecture, and the reverse will be the case where mere convenience, or convenience in combination with beauty or magnificence, is sought.

The speculative and poetical character of the Greeks was exhibited in their temples, while their preference of the state to the individual appeared in the fact that their structures were designed for the worship of the protecting divinity of the city by the citizens, not for the worship of a personal god by the individual man.

Among the Romans, again, terrestrial power and material aggrandisement were the exclusively national aspirations, and consequently their architecture had their own honor and glory primarily in view. The basilicas, amphitheatres, and triumphal arches of the Romans were their own; but the temples which they raised in honor of the gods were little else than imperfect copies from the Greek.

Then, when we come to mediæval times, though on the revival of spiritual tendencies æsthetic principles again become prominent, they exhibit themselves under totally different forms; and the distinctions between heathen and Christian thought could scarcely be more distinctly stated in words than they are exhibited to the eye in the difference between a Greek temple and a Gothic cathedral.

Domestic life again appeared in full purity and vigor only in modern times, and then only do we see the utilitarian principles of architecture finally prevailing over the æsthetic. But apart from the mental characteristics and tendencies of a people there are many other circumstances which modify their architecture. Of these one of the most important is climate. Arrangements for the permanent and commodious residence of the family within doors could not be expected to attain much perfection among a race like the Greeks, whose life was passed in the open air.

**References.**—Hamlin's *Text-Book of the History of Architecture*; Rosenkranz, *Handbook of Architectural Styles*; Fletcher, *History of Architecture on the Comparative Method*. The most complete general work in English is Fergusson's *History of Architecture*; and also the French *Dictionnaire de l'Architecture*; and the English *Encyclopædia of Architecture*; but Sturgis' *Dictionnaire of Architecture* is best for exhaustive study.

**Sculpture.**—The art of giving form and expression, by means of the chisel and other implements, to masses of stone or other hard substances, so as to represent figures of every description, animate and inanimate; the term *carving*, sometimes applied to sculpture, being more generally limited to works in wood or ivory.

In whatever country the earliest attempts were made, the Egyptians were the first who adopted a certain style of the

art. Their works were gloomy and grave, but still they were full of deep sentiment; and connected, as would appear by the hieroglyphics which covered them, with poetry and history, and by the mummies, with the belief of immortality. The progress of this beautiful art reached its highest stages in the classic days of Greece, and though all the treasures of the Grecian sculptors had been carried to deck the Roman capital, the art never became naturalized.

During the long and gloomy interval of barbarism that succeeded the downfall of imperial Rome, sculpture, with the sister arts, lay dormant and forgotten. At length, however, through the genius of Michelangelo and the skill and perseverance of some of his distinguished successors, the treasures of antiquity were collected, and modern art nobly tried to rival the grace and sublimity which existed in the ancient models. For three centuries these antiques have been gathered, and now constitute the present inestimable collections of the Vatican, the Capitols, of Naples, Paris, London, and Berlin.

Modern sculpture has attempted little in comparison with modern painting; yet in Angelo and Thorwaldsen it has produced works holding rank with those of the best period of Greece.

The sculptor's art is limited in comparison with others, but it has its variety and intricacy within its proper bounds. Its execution is correct; and when to correct and perfect form is added the ornament of grace, dignity of character, and appropriate expression, as in the *Apollon Belvidere*, the *Venus de Medici*—which is the finest remnant of ancient art—the *Laocoon*, the *Moses* of Michelangelo, and many others, this noble art may be said to have accomplished its purpose. Few American sculptures worthy of note were executed previous to Greenough's time, but within the last half century the works of Hiram Powers, Crawford, Brown, Clevenger, Rogers, Palmer, Miss Hosmer, Vinnie Ream, and others, have brought American talent in this department of art to the pinnacle of reputation not inferior to that of contemporary European sculptors.

**Painting.**—The art of representing objects in nature, or scenes of human life, with fidelity and expression, upon a plane surface, by means of a pencil or crayon, and of various colored bodies called *pigments*. It consists of two parts—*design*, or the art of representing the contour of objects; and *color*, which gives to the image not only the color but also the form and relief proper to each object.

Coeval with civilization, painting was practiced with success by the Greeks and Romans; obscured for many ages, it revived in Italy in the fifteenth century, producing the Roman, Venetian, and Tuscan schools; afterward the German, Dutch, Flemish, French, and Spanish schools. The painting of the Egyptians, as is evident from the specimens found in their tombs, was very rude; that of the Etruscans, as seen on their vases, was extremely elegant; that of the Greeks, from the praises bestowed on some of their productions by the ancients, must have had considerable merit; and that of the Romans, as evinced by what we find in Pompeii, must have attained a high degree of excellence.

The art of painting is distinguished into *historical*, *portrait*, *landscape*, *animal*, *marine*, etc.; and, as regards the form, the materials, into painting in oil,

*water colors*, *fresco*, *distemper*, *miniature*, *mosaic*.

Historical painting is the noblest and most comprehensive of all branches of the art; for in that the painter vies with the poet, embodying ideas, and representing them to the spectator. He must have technical skill, a practiced eye and hand, and must understand how to group his well-executed parts so as to produce a beautiful composition; and all this is insufficient without a poetic spirit which can form a striking conception of an historical event or create imaginary scenes of beauty.

**References.**—*Dictionary of Painters and Engravers*, Biographical and Critical, by E. Graves and Sir Walter Armstrong; *A Text-Book of the History of Painting*, John C. Van Dyke, L.H.D.; *The History of American Painting*, Samuel Isham; *Cyclopedia of Painters and Paintings*, Champlin and Perkins; *The Index Guide to Travel and Art Study in Europe*, Lafayette G. Loomis, *Modern Gallery Pictures*.

**Tuscan School.**—Style elevated and bold, seeking rather to ascend to ideas than to imitate; sometimes gigantic; neglects coloring and grace.

**Representatives.**—Cinabrese, Giotto, Andrea di Saffi, Masaccio, Bernardo Rossellino, Verrocchio, Andrea Castagna, Pisanelli, Ghirlandajo, Leonardo da Vinci, Bartolommeo di San Jacopo, Baldassari, Giovanni Veronesi, Buonarroti, Domenico Beccafumi, Andrea del Sarto, Jacopo Caraccioli da Pontormo; Del Rosso, Perino del Vaga, Daniele da Volterra, Francesco Salviati, Giorgio Vasari, Antonio Tempesta, Luigi Carracci, Francesco Albani, Marco Rinaldi, Pietro Berraini, called Pietro da Cortona, Paolo Testa, Benvenuto da Garofoli, Carlo Dolci, Benedetto Luti, Giovanni Geronimo Serravallo, Pompeo Battoni.

**Roman School.**—Carries invention and design to the highest perfection; by the analytical study of the antique and of nature; heads of the most sublime beauty; coloring and chiaroscuro less perfect.

**Representatives.**—Bernardino Pinturicchio, Pietro Perugino, Raphael, G. P. Penni, Giulio Romano, Federico Barocci, Taddeo Zuccaro, Jacopo Zuccheri, Domenico Fetti, Nicholas Poussin, Giovanni Lorraine, Bernini, Andrea Sacchi, Claude Gellée, called Le Lorrain, and Corradini. G. B. Salvi, called Il Sanseverino, Gaspar Dughet, called Poussin or Guaspre, Luigi Serravallo, Francesco Albani, Giovanni Stanetti, Giovanni Lauri, Carlo Maratti, Ciro Ferri, Pietro Bianchi, Raffaele Menga.

**Venetian School.**—Faithful imitation of well-chosen subjects of nature, excellent coloring, admirable effect; design less perfect through the neglected study of the antique and of the classical art.

**Representatives.**—Gentile Bellini, Andrea Mantegna, Giorgione, Titian (Tiziano Vecelli da Cadore), G. A. Baglioni, Sebastiano del Piombo, Jacopo da Ponte, J. Robusti (called Il Tintoretto), Paolo Veronese, Andrea Schiavone, Gerolamo Musiano, Paolo Cagliari, Giuseppe Porta, Dorio Varotari, Felice Riccio, Jacopo Palma (Il Vecchio), Jo. Palma, Gio. Contarini, Maria Tintoretto, Leonardo Corbelli, Tiberio Tinelli, Alessandro Turchi, Gio. B. Langetti, Andrea Poma, Francesco Trevisani, Sebast. Ricci, Ant. Balestra, Rosa Albani, Gio. Antonio Pellegrini, G. B. Piazzetta, Ant. Canale, Gio. Batt. Tiepolo, Giuseppe Nogari.

**Lombard and Bolognese Schools.**—Correggio, born in Lombardy, not having founded a permanent school, having been imitated by the painters of Bologna, these two schools are united. Correggio's distinguished characteristics are a seducing and voluptuous (though perhaps somewhat affected) grace in his figures and attitude and a magic harmony in his coloring. Tibaldi and the Carracci, called the Bolognese, of a more character of design, and many of their pupils unite therewith the fine coloring and the grace of Correggio.

**Representatives.**—Francesco Franco, F. Primaticcio, Correggio Antonio Allegri, Polidoro Caldari Jr., Massaccio, Pellegrino da Sanseverino, Francesco, M. Angelo Amerighi (called Caravaggio), Lodov. Caracci, Apollonio Caracci, Annibale Caracci, Giovanni Battista Tiepolo, Giovanni Guido, Lionello Spada, Alex. Tiarini, Francesco Albano, Giacomo Carvedone, Dom. Zampieri (called Donato), Felice Lanfranco, Francesco Gessi, G. F. Barbieri, Lodov. Lanzi, Mic. Ang. Colonna, Grimaldi, Giorg. And. Strani, Simone Tintoretto, F. F. Bassano, Jac. Canali, F. C. Lodov. Quilici, Ant. Francheschini, Guis. del Sole, Fer. Galii, Balderna, Gio. Maria Crespi, Rom. Michelini, Gio. Maria Crespi, Gio. P. Zanotti, G. P. Panini.

**Neapolitan, Genoese, Spanish.**—These nations are not particularly having founded a permanent school; their productions follow the masters of the great Italian schools.

**Neapolitan.**—The painters of this nation are reproached with being in general somewhat

Neapolitan.

Neapolitan.

Neapolitan.

Neapolitan.

Neapolitan.

Neapolitan.



affected. Pietro and Tommaso Stefani, Fil del Tesararo, Gio Cesare d'Appino, Ansaldo Falcone, Mario Nuzzi, Matteo Nuzzi, Salvatore Nuzzi, Anna Luciana, Frac. Solimando, Nunzio Ferajoli, Sebast. Cosca, Carl Corrado.

**Genese** are often *incognita*. In design.—Nich. da Vottri, Camisias, B. G. Pagni, Ben. Castelli, Bernardo Strossi, Gio. Carione, Benedetto Casalingo, F. M. Borroni, G. M. Biondi, Greg. Ferrari, Bart. Guidoboni, Il Molinarotto.

**Spendars**.—These painters have especially imitated the Venetian school. In design.—Giov. Battista, brilliant coloring.—Alonso Berragente, Blaise de Prado, Morales, Luis de Vargas, J. F. Ximenes de Navarrete, Pablo de Villalpando, Juan de Ribera, Don Diego Velasquez de Silva, Alonso Cano, Henriquez de las Marinas, Bartolome Esteban de Murillo, Frac. Ribal, Alvaro de Torres, Pedro de Nunez, Juan de Alifaro, Juan C. Faleo, P. di Pietro.

**German School**.—This school, having never had a common point of union, bears no general and distinctive character; it produces, in the different styles of painting, rival artists to the great masters of Italy and of the Netherlands.

**Representatives**.—Th. de Malina, Theo. de Pragen, N. Wurms, Albert Dürer, Lucas Möller, Hans Holbein, Lucas Cranach, Tobias Stimmer, Christ. Schwartz, John Van Aachen, J. Rottemmayer, J. Ley, Adam Elsheimer, J. M. W. Hauser, Jo. Sandrart, Ch. Lott, Goyardt, J. J. van der Fae, J. Spilberg, Leht. Ropkorp, J. J. Langelbach, J. J. Langelbach, J. J. Langelbach, Gasp. Netscher, Abt. Mignon, M. S. Merian, Godfrey Kneller, O. F. Hogenbuech, J. B. Huber, J. B. Huber, H. Huber, J. B. Huber, J. E. Nidegger, Brinkman, C. W. E. Dietrich, Rudolf Menze, Riemann, G. W. E. Dietrich.

**Flemish or Belgic School**.—This school excels in coloring and in the faithful imitation of nature, but does not always exhibit sufficient nobleness of design; it produces excellent artists in every style; that to which Teniers has affixed his name and its birth in this school; the academy at Antwerp, the cradle of this school, was founded in 1560, but there was a society of painters at Antwerp from the year 1409.

**Representatives**.—Hubert van Eyck, Jan van Eyck, Quentin Messia, Ber. V. Orley, J. de Mabuse, Peter Knock, Frans Flinck, Pieter de Keyser, F. Forbus, B. Spranger, C. Van Mander, H. Breenyck, Deysa Calvert, Otto Venius, P. Van Breughel, P. Neefs, S. Forbus, J. F. X. Forbus, Paul Rubens, David Teniers, James Jordens, Anthony Van Dyck, Philip de Champaigne, David Teniers, J. Van Arden, G. W. E. Dietrich, J. B. Huber, Simon Varet, G. P. de Vuerghen, Abt. Breughel, Henry de Court.

**Dutch School**.—This school is especially distinguished by an entire neglect of the chiaroscuro; exhibits good coloring, and a faithful imitation of nature in the minutest details. The microscopic style of this school is called the highest pitch in this school.

**Representatives**.—Erasmus, Lutz de Leyden, Martin Schenk, An. More, Abt. Blomart, Sol. de Bred, Cornelius Poelenberg, Leo Brainer, B. D. de Heven, John Wynants, Albert Cuyt, Paul Rembrandt van Ryo, Gerard Terburg, Adrian van Ostade, Gerard Dou, Gabriel Matzu, Philip Wouvermans, Nicholas Bergham, Paul Potter, Ludolf Bakhuizen, Van der Velde, Jac. Ruysdael, Hobbema, Fran. Mieris, John Steen, Van den Heyden, Adrian van der Velde, Karel du Jardin, John Wessels, Jan van der Werf, Jan van Huysum.

**English Painters**.—Formed in general on the masters of the French and Italian schools; excel in portraits and landscapes, are unrivaled in water-colors.

**Representatives**.—Hans Holbein, F. Zuercher, Isigo Jones, P. Oliver, B. Cooper, W. Dobson, Ric. Gibson, John Greenhill, Godfrey Kneller, Luke Lindock, James Thornhill, William Verelst, Rich. Wilson, Joshua Reynolds, Thomas Gainsborough, Hawley Gilpin, P. J. de Louthbourg, David Allan, Benjamin West, John Sturt, James Northcote, J. F. Nollekens, Philip Reinagle, William Hamilton, Wm. Beechey, Thos. Stothard, Francis Bourgeois, John Opie, Geo. Morland, Thomas Lawrence, Edward Bird, John Constable, Will. Hilton, Geo. Hen. Harlow, Thomas Daniel, David Wilkie, R. B. Haydon, A. W. Calcott, W. Etty.

**French School**.—The good painters of this school are formed on the models of the schools of Flanders, of which they bear the general characteristics; they are in general more successful in composition and design than the school of Italy, and are emancipated by Venetian from the degradation and affected style it assumed after the death of Le Brun, and has become the most numerous and flourishing school of all.

**Representatives**.—Fran. Primaticcio, Rosso de Rossi, Jean Cousin, Jean Veret, Claude Lorraine, Jean Petitot, Sebastian Bourdon, Etienne Le Sueur, Charles Le Brun, Jacques-Louis David, John Jouvenet, Joseph Vernet, Nicholas Bertin, Anth. Rivet, Ant. Watteau, Francis Le Moine, Noel N. Coyppe, Chas. Le Brun, Joseph Vernet, Vien, J. B. Deshayes, J. L. David, Carl Veret, A. L. Girodet.

**Music**.—Is a combination or succession of sounds, having the property of *pitch*, so arranged as to please the ear. The pleasure derived from music arises from its excitation of agreeable sensations, and consequent pleasing mental images and emotions. Apart from words, it expresses passion and sentiment, and, linked to words, it loses its vagueness, and becomes a beautiful illustration of language. The doctrine of musical sounds is based on the principles of acoustics.

**Forms**.—Musical compositions are either for the voice, with or without instrumental accompaniment, or for instruments only. Of vocal music, the principal forms may be classed as church music, chamber music, dramatic music, and popular or national music. The first includes plain song, faux bourdon, the chorale, the anthem the sacred cantata, the mass and requiem of the Roman Catholic church, and the oratorio. Vocal chamber music includes cantatas, madrigals, and their modern successors, glee, as also recitatives, arias, duets, trios, quartets, choruses, and generally all forms, accompanied or unaccompanied, which are chiefly intended for small circles. Dramatic music comprehends music united with scenic representation in a variety of ways, in the ballet, the melodrama, the vaudeville, and the opera, in which last music supplies the place of spoken dialogue. Instrumental music may be composed for one or for more instruments.

**History**.—A certain sort of music seems to have existed in all countries and at all times. Even instrumental music is of a very early date: representations of musical instruments occur on the Egyptian obelisks and tombs. To the music of the Egyptians, nothing analogous seems to have existed among the nations of antiquity. The early music of the Christian church was probably in part of Greek, and in part of Hebrew origin. St. Ambrose and Gregory the Great directed their attention to its improvement, and under them some sort of harmony or counterpoint seems to have found its way into the service of the church. The opera, which appeared nearly contemporaneously with the reformation and revival of letters, greatly enlarged the domain of music. Italy advanced in melody and Germany in harmony. Instrumental music occupied a more and more prominent place. Corelli's compositions exalted the violin. Lull and Rameau, with their beautiful music, added the characteristics of French taste. In the German Gluck drove them out of the field. The scientific and majestic figure reached its highest perfection under J. S. Bach. The changes introduced in ecclesiastical music in England at the Restoration gave birth to the school of Purcell; and a little later, England adopted the German Handel, who was the precursor of Haydn, Mozart, Beethoven, Spohr, and Mendelssohn. The principal fact in recent musical history is the movement with which the name of Wagner is connected, having for its aim the production and perfection of a true musical drama, in which, unlike the opera, the words and music shall be of equal importance.

Initiative music suggests something external to the mere melody and harmony, as *motion*, *notions*, and objects of sight. By ascending and descending strains and cadences modern composers express soaring, sinking, etc. The varied sounds of battle, funeral processions, domestic

sounds, tempests, notes of birds, etc., are produced by variation of tone. A certain correspondence has been found between sight and hearing to admit of the representation of objects of the latter sense by musical tones, but the interpretation must be assisted by words.

**References**.—For general histories of music see by Burney, Hawkins, Fétis, Ritter, Naumann, Rockstro, and Parry; also *The Oxford History of Music*; Chappell's *Popular Music of the Olden Time*; Hullah's *Modern Music*; Davy's *History of English Music*; Riemann's *Dictionary of Music*; Grove's *Dictionary of Music and Musicians*; and Hullah's *Musical Glossary*.

**Ceramics**.—As here used is that branch of art which comprises all objects made of clay or sand, as vases, cups, urns, statues, etc., including all ornamental or artistic varieties of pottery, porcelain and glassware.

Of all the industrial arts, there is perhaps not one which can rival the stilet art in the harmonious combination of utility and beauty. Porcelain and glass exhibit the most marked triumph of scientific industry over the original worthlessness of the materials on which that industry is exercised. The change wrought in clay, sand, and flint, by the annealing and vitrifying processes, is hardly less wonderful than that which the alchemists hoped to effect by the transmutation of metals. The Babylonians, the Egyptians, and the Etruscans became potters from their vicinity to the Euphrates, the Nile, and the rivers of northern Italy. The Etruscans improved on the Egyptians, as the Greeks afterward improved on them, produced forms of the most elegant kind. The Roman vessels were generally less slender and graceful than those of the Greeks; they partook more of the utilitarian spirit of the *masters of the world*; still they were not without beauty, and were surpassed by their vessels being often decorated with much elaborate display. But in the following centuries the art almost disappears, until it was reintroduced into Europe from China in the fifteenth century.

The beautiful ware called *majolica* was invented by Luca della Robbia at Florence, and greatly extended by Orazio Fontano, of Pizzaro, at the close of the fifteenth and beginning of the sixteenth centuries. In 1553 the celebrated Palsay discovered at Saintes the art of glazing or enameling a gray paste, and introduced dishes and other objects with fruit, fish, and animals moulded from life, distributed over the surface, as a kind of ornamented ware. The German and Flemish pottery, ranging from 1540 to 1620, is remarkable for the quaint variety of its designs; it is, however, exceedingly original and artistic. None of this ware, however, was of the nature of the Chinese porcelain, and various unsuccessful attempts to discover the secret of its manufacture had been made in several countries, when Bottger discovered white *kaolin* at Aue, and produced from it a white hard porcelain at Meissen, near Dresden, where the first porcelain establishment was founded under royal auspices in the beginning of the eighteenth century.

In 1720 and 1751 respectively were founded in Vienna and Berlin the works in which the famous wares of those places have since been made. In France, porcelain was first manufactured in 1735 at Chantilly, whence, in 1754, the works were removed to Sevres, where they have continued in operation to the present time. Porcelain was made in England in the middle of the last century, first

\* After Holfbein settled in England he practically founded the English school.

at Chelsea, and afterward at Stratford le Bow, Derby, Plymouth, Worcester, etc. Staffordshire is also an important seat of the porcelain manufacture. In the United States, the materials for many

sorts of ware are good; but, owing to the cheapness and perfection of the porcelain imported from Europe, the manufacture has made little progress until recently. Trenton, N. J., claims to rank as the

chief manufacturing center of this industry. References.—*Prime's Pottery and Porcelain of All Times and Nations*; Barber's *Pottery and Porcelain of the United States*; E. Bourry's *Traité sur la Céramique Industrielle*; Langes's *The Chemistry of Pottery*; Jervis' *Encyclopedia of Ceramics and Glass Technology*.

### WORLD'S FAMOUS PAINTINGS

#### I. In the Rijks Museum, Amsterdam

TITLE OF PAINTING	PAINTER	SCHOOL	OBSERVATIONS
THE NIGHT WATCH.	Rembrandt (1607-1669).	Dutch.	Captain Banning Cock's company of musketeers coming out of the guard house. Wonderful arrangement of light and shade on figures. A masterpiece of portrait arrangement.
DIRECTORS OF THE CLOTH-MAKERS' GUILD.	Rembrandt (1607-1669).	Dutch.	
BANQUET OF THE GUARD.	Van der Helst (1612-1670).	Dutch.	On the occasion of the peace of Westphalia in 1648. Sir Joshua Reynolds called it as one of the first pictures in the world.
THE NIGHT SCHOOL.	Gerard Dou (1613-1675).	Dutch.	One of his celebrated works, containing ten figures, with the dead Christ in the center.
A LADY.	Netcher (1639-1684).	Dutch.	Excellent rendering of water in movement, by one of the great landscape painters of all times.

#### II. In the Antwerp Museum

CRUCIFIXION.	Peter Paul Rubens (1577-1640).	Flemish.	Considered one of this master's chief d'œuvre. Sir Joshua Reynolds ranked it as one of the first pictures in the world.
THE ENTOMBMENT.	Quinten Matsys (1466-1531).	Flemish.	One of his celebrated works, containing ten figures, with the dead Christ in the center.
THE WATER WHEEL.	Hobbema (1638-1709).	Dutch.	Excellent rendering of water in movement, by one of the great landscape painters of all times.
THE MANDOLIN PLAYER.	Terburg (1617-1681).	Dutch.	Equisite treatment of surfaces and intimate surroundings of a Dutch interior.

#### III. In the Berlin Museum

LEDA AND THE SWAN.	Correggio (1494-1534).	Parmaese.	A theme the artist painted many times, with great success.
CHILDREN OF CHARLES FIRST.	Van Dyke (1590-1641).	Flemish.	Justly considered one of the greatest of all the world's portraits of children.
THE WINDS OF THE ADORATION.	The brothers Hubert and Jan Van Eyck (1390-1440).	Flemish.	One of the most elaborate altarpieces ever painted.
BOY BLOWING BUBBLES.	Vermeer (1632-1675).	Dutch.	Highly representative work of a most brilliant craftsman, one of the best of the series known as "the Little Dutchmen," and of recent years more fully appreciated at his true worth.
MADONNA COI BAMBINO.	Raphael (1483-1520).	Umbrian.	An early work by this most famous painter of Madonnas. One of his best figures in a rocky landscape. There are several other important examples by this master in this gallery.
SAINT ANTHONY AND THE INFANT CHRIST.	Murillo (1618-1682).	Spanish.	One of the best of a long series of such pictures painted by this distinguished Spaniard.

#### IV. In the Borghese Gallery, Rome

MADONNA.	Botticelli (1446-1510).	Florentine.	Botticelli was famous for his deep religious sentiment as expressed in his paintings and for exquisite finish.
LEDA AND THE SWAN.	Leonardo da Vinci (1452-1510).	Florentine.	It is fair to say that modern critics contest this attribution and in fact there are but few authentic works extant by Da Vinci.
SACRED AND PROFANE LOVE.	Titian (1477-1576).	Venetian.	An undisputed masterpiece, full of glorious coloring and of splendid conception and execution.
ENTOMBMENT.	Van Dyke (1590-1641).	Flemish.	A highly important example containing eleven figures.
ENTOMBMENT.	Raphael (1483-1520).	Umbrian.	Gracful arrangement of four nude figures.
DANAE.	Correggio (1494-1534).	Parmaese.	Nearly painted, and of deep religious feeling.
MADONNA.	Bellini (1428-1510).	Venetian.	

#### V. In the Brera Gallery, Milan

SAINT MARK.	Bellini (1428-1510).	Venetian.	A famous work depicting the marriage of the Virgin and Joseph by the high priest, in the court of the temple.
THE SPORALIZO.	Raphael (1483-1520).	Umbrian.	
PORTAIT OF A LADY.	Rembrandt (1607-1669).	Dutch.	A favorite theme with Van Dyke and his contemporaries.
VIRGIN, CHILD AND SAINT ANTHONY.	Van Dyke (1590-1641).	Flemish.	There are also others by Titoretto in this gallery.
SAINT HELEN.	Titoretto (1518-1594).	Venetian.	
HEAD OF CHRIST.	Da Vinci (1452-1510).	Florentine.	

#### VI. In the Brussels Museum

PORTRAIT OF THOMAS MORUA.	Holbein the Younger (1497-1533).	German.	One of his prized works, well known through reproduction.
ABRAHAM AND EVE.	Van Eyck (1390-1440).	Flemish.	Full of extraordinary detail and deep religious feeling.
PORTAIT.	Rembrandt (1607-1669).	Dutch.	
PIETA.	De Crayer (1582-1609).	Flemish.	
FOREST.	Hobbema (1638-1709).	Dutch.	Hobbema was famous for his rendering of wood interiors and this is particularly representative.
WIFE OF CHARLES DE CORDON.	Rubens (1577-1640).	Flemish.	Of unusual, rich color and free brush work.
FLEMISH FAIR.	Teniers (1610-1693).	Flemish.	Teniers' name is associated with such characteristic episodes in village life.
HIMSELF AND WIFE.	Gerard Dou (1613-1675).	Dutch.	A painter of great detail, which he yet kept broad to a degree.

#### VII. In the Dresden Gallery

THE SISTINE MADONNA.	Raphael (1483-1520).	Umbrian.	One of the most famous and popular of all the world's pictures. By many considered Raphael's masterpiece. It was painted for the monastery of San Sisto, at Piacenza, Italy, and is a shrine for admirers of this artist. It has been reproduced in many mediums.
LA NOTTE.	Correggio (1494-1534).	Parmaese.	This picture, <i>The Night</i> , is a representation of the Adoration of the Shepherds and was formerly known as <i>Madonna de Regio</i> .

## WORLD'S FAMOUS PAINTINGS—Continued

## VII. In the Dresden Gallery—Continued

TITLE OF PAINTING	PAINTER	SCHOOL	OBSERVATIONS
MARRIAGE AT CANA.	Veronese (1528-1588).	Venetian.	Painted many times by Veronese, the most important canvas being at the Louvre, Paris.
THIRTEEN MONKS.	Titian (1477-1576).	Venetian.	The last is a sumptuous work in rich, glowing color.
CUPID CROWNING VENUS.	Basoferatto (1605-1665).	Roman.	A fine canvas, for many years attributed to Titian.
SLEEPING VENUS.	Palma Vecchio (1480-1528).	Venetian.	
VENUS REPOSING.	Caravaggio (1560-1609).	Roman.	This artist painted many pictures of the same theme.
FORTUNE TELLER.	Ribera (1588-1656).	Spanish.	The artist, known as <i>Lo Spagnoletto</i> , painted much for churches and religious houses.
SAN MARTIN OF EGYPT KNEELING AT THE GRAVE.	Murillo (1618-1682).	Spanish.	
SAINT ROBERTOUE.	Murillo (1618-1682).	Spanish.	
VIRGIN AND CHILD.	Van Dyke (1599-1641).	Flemish.	Official portrait painter to the English court. Van Dyke limned all these people many times.
CHARLES I. OF ENGLAND.	Van Dyke (1599-1641).	Flemish.	
THE CHILDREN OF CHARLES I.	Van Dyke (1599-1641).	Flemish.	
HENRIETTA MARIA, WIFE OF CHARLES I.	Van Dyke (1599-1641).	Flemish.	
THE ARTIST'S WIFE.	Rembrandt (1607-1699).	Dutch.	This gallery contains a wonderful collection of Rembrandt's work.
THE ARTIST AND HIS WIFE.	Rembrandt (1607-1699).	Dutch.	
MANDARIN'S SACRIFICE.	Rubens (1577-1640).	Flemish.	One of the most important compositions by this master, containing no less than eight large figures.
JUDGMENT OF PARIS.	Holbein the Younger (1497-1533).	German.	One of the most popular and most reproduced religious pictures in the world, though of recent years its attribution has been questioned.
MADONNA.	Correggio (1494-1534).	Parmaese.	This work is familiar through many reproductions.
BRADING MADDALEN.	Guido Reni (1575-1642).	Italian.	Characterized by his usual detail and finish, a beautiful example.
CROWNED WITH THORNS.	Guido Reni (1575-1642).	Italian.	
LADY IN SATIN.	Terburg (1617-1691).	Dutch.	

## VIII. In the Academy of Fine Arts, Florence

ALLEGORY OF SPRING.	Botticelli (1446-1510).	Florentine.	World famous for its graceful arrangement of beautiful nudes.
COUPELION.	Botticelli (1446-1510).	Florentine.	This gallery is particularly rich in the pictures of its townsman, Botticelli.
CORONATION.	Botticelli (1446-1510).	Florentine.	
A FREDERICK.	Da Vinci (1452-1510).	Florentine.	This is in a painting by Verrocchio, and was painted when Da Vinci was his pupil.
MARY MADONNAS.	Ghirlandajo (1449-1494).	Italian.	
AN ANGEL.	Ghirlandajo (1449-1494).	Italian.	
THE NATIVITY.	Ghirlandajo (1449-1494).	Italian.	

## IX. In the Royal Museum, The Hague

THE YOUNG MOTHER.	Gerard Dou (1613-1675).	Dutch.	One of his very best examples.
THE ANATOMICAL LECTURE.	Rembrandt (1607-1699).	Dutch.	One of the great paintings of all time, containing many figures showing seven students listening to a lecture by the famous Dr. Nicolaas Tulp, who is dissecting a dead body. Rembrandt's fame dated from this picture. It was painted for the Guild of Surgeons, Amsterdam. Curiously enough, several famous painters have rendered the same theme, among them:—Aert Pieterman, Thomas de Keyser, Nicolas Elias, and Pieter van Miereck. There are several other important examples by Rembrandt in the Hague gallery, notably, <i>The Presentation in the Temple</i> and <i>The Fight Into Egypt</i> .
THE YOUNG BULL.	Paul Potter (1625-1654).	Dutch.	The most famous cattle picture in the world, painted when the artist was but twenty-seven. The animal is the size of life, another animal is lying near a tree by which are some sheep, and to one side is a peasant. Back of them there is a familiar Dutch landscape. Recent critics qualify the earlier profound admiration for this work.
PORTRAIT OF PAUL POTTER.	Van der Helst (1612-1670).	Dutch.	

## X. In the Museum of Haarlem

BANQUET OF OFFICERS OF ARCHBISHOPS OF SAINT GEORGE.	Frans Hals (1580-1666).	Dutch.	This large canvas contains twelve figures and is justly famous. The greatest claim this museum possesses is its superb collection of the work of its eminent townsmen.
BANQUET OF OFFICERS OF ARCHBISHOPS OF ST. ANDREW.	Frans Hals (1580-1666).	Dutch.	All of these works may be considered as masterpieces.
ASSEMBLY OF OFFICERS OF ARCHBISHOPS OF ST. ANDREW.	Frans Hals (1580-1666).	Dutch.	
OFFICERS AND SERGEANTS OF ARCHBISHOPS OF ST. GEORGE.	Frans Hals (1580-1666).	Dutch.	
GOVERNORS OF THE ELIZABETH HOSPITAL.	Frans Hals (1580-1666).	Dutch.	
GOVERNORS OF THE HOSPITAL FOR OLD MEN.	Frans Hals (1580-1666).	Dutch.	
LADY GOVERNORS OF THE HOSPITAL FOR OLD WOMEN.	Frans Hals (1580-1666).	Dutch.	

## XI. In the Hermitage, St. Petersburg

HOLY FAMILY.	Raphael (1483-1520).	Umbrian.	This gallery is wonderfully rich in examples of Rembrandt's work.
THE DESCENT FROM THE CROSS.	Rembrandt (1607-1699).	Dutch.	
PORTRAIT OF AN OLD JEW.	Rembrandt (1607-1699).	Dutch.	
BOLDERS.	Rembrandt (1607-1699).	Dutch.	
HIS MOTHER.	Rembrandt (1607-1699).	Dutch.	
THE FARM YARD.	Rembrandt (1607-1699).	Dutch.	

## XII. In the Louvre, Paris

MADONNA OF THE CRADLE.	Raphael (1483-1520).	Umbrian.	
ST. GEORGE AND THE DRAGON.	Raphael (1483-1520).	Umbrian.	
LA BELLE JARDINIÈRE.	Raphael (1483-1520).	Umbrian.	
PORTRAIT OF HIMSELF.	Rembrandt (1607-1699).	Dutch.	
PORTRAIT OF HIMSELF.	Rembrandt (1607-1699).	Dutch.	
EMMAUS.	Rembrandt (1607-1699).	Dutch.	
PHILOSOOPHERS.	Rembrandt (1607-1699).	Dutch.	
THE SAMARITAN.	Rembrandt (1607-1699).	Dutch.	

## WORLD'S FAMOUS PAINTINGS—Continued

## XII. In the Louvre, Paris—Continued

TITLE OF PAINTING	PAINTER	SCHOOL	OBSERVATIONS
ERASMUS.	Holbein, the Younger (1497-1543).	German.	One of the world's famous portraits of deep human interest.
SOLDIER AND MAIDEN.	Torbjurg (1617-1681).	Dutch.	A cabinet picture of great charm and delicacy of finish.
OFFICER ADDRESSING A LADY.	Metsu (1650-1667).	Dutch.	A graceful composition by a master of genre work.
THE DRACONIC WOMAN.	Gerard Dou (1613-1678).	Dutch.	Very famous as being of a somewhat repulsive theme which the painter has by sheer force of craftsmanship made most interesting.
THE IMMACULATE CONCEPTION.	Murillo (1618-1682).	Spanish.	This artist, as well as his contemporaries, painted this theme frequently, but this picture is the most famous of all and is a large canvas full of figures, exquisitely rendered.
THE BIRTH OF THE VIRGIN.			
LA MATHÈREUSE DU TITIAN.	Titian (1477-1576).	Venetian.	A world-famous picture of deep religious significance.
THE ENTOMBMENT.			Universally considered one of the greatest masterpieces of portraiture that the world has ever seen.
THE MAN WITH THE GLOVE.			The collection is particularly rich in the work of this masterly Venetian.
CROWNED WITH THORNS.			
THE HOLY FAMILY.			
MONA LISA.	Leonardo da Vinci (1452-1510).	Florentine.	Perhaps the greatest single figure piece ever painted. It is a portrait of the wife of Zanobi del Giocondo, and the canvas is sometimes referred to as "La Gioconda." Da Vinci is said to have spent four entire years on the picture, which he sold to Francis I. for the then extravagant price of four thousand gold florins, a terrific amount for those days. It has been the shrine for art worshippers and students for many years. Many copies of this work, some by pupils of Da Vinci are in the various galleries of Europe.
SAINT ANNE.			Among the few authentic pictures by this great artist.
SAINT JOHN, THE BAPTIST.	Paul Veronese (1528-1588).	Venetian.	The Louvre is full of masterpieces and this is one of its most famous, being an enormous canvas, of sumptuous coloring, containing portraits of Francis I. and his queen, Mary of England, the Emperor Charles V., and many painters, including the artist himself, Titian, Tintoretto and others.
THE MARRIAGE AT CANA.			
RETREAT OF SAINT CATHERINE.	Correggio (1494-1534).	Parmaese.	
ANTHOPE AND JOSEPH DISGUISED AS A SATYR.			
THE MUSIC LESSON.	Torbjurg (1617-1681).	Dutch.	One of the famous genre of painting executed in great detail.
SHOOTING MATCH.	Van der Heist (1612-1670).	Dutch.	
CHILDREN OF CHARLES I.	Van Dyke (1590-1641).	Flemish.	Van Dyke gave the greatest distinction to his portraits, of which, though he died at the early age of forty-two, he did many.
CHARLES I. AT FULL LENGTH, WITH HORSE AND SUTLE.			
ISABELLA OF SPAIN.			
THE DUKE OF RICHMOND.	Guido (1575-1642).	Italian.	A most representative collection of the work of this popular painter.
SAINT SEBASTIAN.			
MARY MAGDALEN.			
THE HOLY FAMILY.			
PORTRAIT OF THE INFANTA MARGARITA.	Velasquez (1590-1660).	Spanish.	A comprehensive representation of this great master's methods of work.
MARIA.			
THE INFANTA MARIA TERESA.			
PHILIP IV.			
MEETING OF GENTLEMEN.			
LAVERING GIRL.	Frans Hals (1584-1666).	Dutch.	All are excellent examples, but this Dutch master is seen at his best in the gallery of his native place, Haarlem.
PORTRAIT OF A LADY.			
PORTRAIT OF THE BERNSTEIN FAMILY.			
THE EMBARKATION FOR CYTHERA.	Antoine Watteau (1684-1721).	French.	Considered one of the most beautiful pictures in the world, of great charm, originality and poetic feeling.
CHILDREN OF THE COMEDIE ITALIENNE.			
L'INDIFFÉRENT.			
THE BROKEN PITCHER.	Greuse (1725-1805).	French.	A very popular work, well known through reproduction.
THE RAFT OF THE MEDUSA.	Germeau (1791-1834).	French.	An epoch-making picture, being a great departure in realism and a protest against the prevailing academic manner. The work when first shown created a great sensation.
PORTRAIT OF MRS. RECAMIER.	David (1748-1825).	French.	Very distinguished canvases and both well known by reproduction.
PORTRAIT OF HIMSELF.			
DATE OF THE HORATII.			
RAPE OF THE SABINE WOMEN.			
CECROPS EXPLAINING THE RIDDLE OF THE SPHEX.	Ingres (1780-1867).	French.	These are hard, academic compositions, the figures rigid and unsympathetic, but drawn with distinction, though the manner of painting is of a curiously artificial period in French art.
APOTHEOSIS OF HOMER.			The picture <i>La Source</i> was painted when the artist was seventy-five and is one of the great works of his time, while some of his portraits are of most distinguished excellence.
LA SOURCE.			
PORTRAIT OF HIMSELF.			

## XIII. In the National Gallery, London

MADONNA AND CHILD.	Cimabue (1240-1302).	Florentine.	Archaic and charmingly naive in its religious earnestness.
MADONNA AND CHILD.	Filippo Lippi (1457-1504).	Florentine.	Unusually fine landscape background to a well-balanced composition of deep religious feeling, characteristic of the times.
SAINT JEROME AND SAINT DOMINIC.	Botticelli (1446-1510).	Florentine.	Of distinguished treatment and original composition arrangement, rendered in alluring detail and with conviction.
MADONNA AND CHILD.			
ENGLINDING VIRGIN.	Raphael (1483-1520).	Umbrian.	Sometimes known as <i>The Bleeding Madonna</i> because it once belonged to the Duke of Marlborough. It is a noble composition, with the Virgin enthroned, St. John on one side and St. Nicholas of Bari on the other. There are other examples by Raphael in this gallery.
THE ANGELOI MADONNA.			
OUR LADY OF THE ROCKS.	Leonardo da Vinci (1452-1510).	Florentine.	This is a masterpiece pure and simple, one of the few authentic known works of Da Vinci, and there is a study for it at the Castle at Windsor.
THE FAMILY OF DARIUS AT THE FEET OF ALEXANDER.	Paul Veronese (1528-1588).	Venetian.	For finish, beauty of conception and profound skill of execution, it is unsurpassed in the world.
PORTRAIT OF THE DOGS LEONARDI LORENZANO.	Giovanni Bellini (1428-1516).	Venetian.	A grand sumptuous composition, eminently characteristic of the master colorist.
A TAILOR.			
BERNARDINI, VENUS AND CUPID.	Giovanni Moretti (1525-1578).	Bergamese.	One of the world's famous portraits, full of character.
PORTRAIT OF JEAN ARNOULT AND HIS WIFE.	Correggio (1494-1534).	Parmaese.	Extraordinary painting of the nude forms of a man, woman and child.
	Jan van Eyck (1390-1440).	Flemish.	A remarkably painted portrait of two hideously ugly Dutch people, almost ludicrously naive in its selection of arrangement, but masterly in its rendering of light, shade and detail.
PORTRAIT OF AN OLD LADY.	Rembrandt (1607-1669).	Dutch.	A famous canvas, showing a seated woman in white cap and ruff.
LA CHAPELLE DE PAUL.	Rubens (1577-1640).	Flemish.	The portrait of a beautiful young woman, thought to have been Mlle. Lunden, wearing a black Spanish beaver hat. The picture was once known as <i>The Spanish Girl</i> . Rubens obviously admired this work, for he never parted with it, and when he died it went to his widow, who also retained it during her life.

**WORLD'S FAMOUS PAINTINGS—Continued**

### XIII. In the National Gallery, London—Continued

TITLE OF PAINTING	PAINTER	SCHOOL	OBSERVATIONS
THE AMBASSADORS.	Hans Holbein (1497-1543).	German.	One of the world's masterpieces, showing two gnomes standing in handsome robes, by a table which is littered with various still-life minutely painted. The floor is of intricate design, and cast diagonally thereon is the object that has been the subject of much speculation. It is apparently a human skull elongated, though for what reason no one seems able to determine. The work is of superlative greatness, however.
CHARLES THE FIRST. PORTRAIT OF GEORGE IV.	Van Dyke (1599-1641).	Flemish.	A great portrait of the monarch on horseback, of rare excellence. A man with a pointed beard, wearing a ruff about his neck, very famous and popular in reproduction.
THE PRACE OF MONNETS. THE AVENUE-MIDDLEHARNAIR.	Terburg (1617-1681). Hobbema (1638-1709).	Dutch. Dutch.	Important composition, with many figures gathered about a table. One of the great landscapes of all time, by a man who received little appreciation during his life.
INTERIOR OF A DUTCH HOUSE. PIERCE OF SPAIN. MARRIAGE A LA MODE.	Pieter de Hooch (1630-1684). Velasquez (1590-1660). William Hogarth (1697-1764).	Dutch. Spanish. English.	Interesting arrangement of light, shade and dexterous rendering of textures. One of the Spanish master's famous portraits of his king. A series of six cartoons or pictures of the fashionable life of the artist's time, telling of the weakness, extravagance and dissipation of the nobility. These and other works here by Hogarth are world-famous. The famous actress seated in graceful pose, in large picture hat.
PORTRAIT OF MRS. SIDGONS.	Thomas Gainsborough (1727-1785).	English.	All of these portraits are human documents of the first order.
PORTRAIT OF TWO GENTLEMEN. DOCTOR JOHNSON. BOWELL. ADMIRAL KEPPEL. HINDSLEY. GEORGE IV. AS PRINCE OF WALES. THE AGE OF INNOCENCE. DREYER DAT.	Sir Joshua Reynolds (1723-1792).	English.	A popular picture full of infinite detail, representing England's famous race track on Epsom Downs, on its fete day.
THE VALLEY FARM.	W. P. Frith (1819-1909). John Constable (1776-1837).	English. English.	A famous landscape, which, with others by Constable, made a profound impression on the French artists who founded the Barbizon school, largely on the work of Constable.
THE FIGHTING TINKERAIRES.	J. W. M. Turner (1775-1831).	English.	An extraordinary colored painting of the famous battleship being towed by last boats, the French frigate being captured.

## XIV. In the Old Pinakothek, Munich

SAINTS JOHN AND PETER. SAINTS PAUL AND MARY. CARPENTIER.	Albrecht Dürer (1471-1528). Wolgemuth (1434-1519).	German. German.	Wonderfully drawn and painted and full of engaging detail.
SACRIFICE OF ISAAC. DESCENT FROM THE CROSS. MARY AND SAINTS. MADONNA CANTIGLIANI.	Rembrandt (1607-1669). Ghirlandajo (1449-1494). Raphael (1483-1520).	Dutch. Italian. Umbrian.	A marvelous composition, with many figures in the costumes of the artist's own time, with the dead Christ on the cross against a background of a medieval city, all rendered in infinite detail.
STREET BOY. THE PUTTICIAN. THE CRUCIFIX. THE SCOURGING.	Murillo (1618-1682). Miers (1635-1681). Gerard Dou (1613-1675).	Spanish. Dutch. Dutch.	A beautiful pyramidal composition that came originally as a part of the dowry of the Princess de Medici, to Elector Wilhelm, about 1807. There are in this gallery five other similar themes by Murillo. This gallery contains fifteen other examples by this artist.
DUTCH INTERIOR. BATTLE OF THE MARONS. ABRAHAM AND HIS ANGELS. THE ENTOMBMENT. THE SCOURGING. ECCE HOMO. THE CRUCIFIXION.	Pieter de Hooch (1632-1681). Rubens (1577-1640). Van der Werf (1659-1722).	Dutch. Dutch. Dutch.	The picture shows the artist at a window. In all there are twelve paintings in this gallery by Dou.

## XV. In the Prado, Madrid

LAS LANCAS (THE SURRENDER OF BRUDA).  THE SPINNERS.  THE ADOPTION OF THE MAGI. THE SUPPER AT EMMAUS. RAPE OF EUROPE. ADAM AND EVE. PORTRAIT OF MARIE DE MEDICI. THE TEMPTATION OF ST. ANTHONY. A VILLAGES FESTIVAL. THE NINETEEN PLAYERS. A SKEETICAL OPERATOR. THE MARTYRDOM OF ST. BARTHOLOMEW. JACOB'S LADDER. ST. JESOME PRATING. ST. FRANCIS IN A DRESS OF ECSTASY. WOMEN FIGHTING IN A CIRCUS. THE ADOPTION OF THE SHEPHERDS. THE PAINTER MAGNIFICENT. CHRIST AND ST. JOHN (NINOS DE LA CONCEPCION). IMMACULATE CONCEPTION (Four examples). VIRGO LISTENING TO MUSIC. THE ENTOMBMENT. VENUS AND ADONIS. THE FALL OF MAN. MATER DOLOSO. PORTRAIT OF CHARLES V. ON HORSEBACK. PORTRAIT OF CHARLES V. ON FOOT. KING PHILIP II. EMPEROR ISRAEL OF PORTUGAL. CHARLES V. AT THE BATTLE OF MURILLO.	Velasquez (1599-1660).    Rubens (1577-1640).  <
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## WORLD'S FAMOUS PAINTINGS—Continued

## XVI. In the Pitti Gallery, Florence

TITLE OF PAINTING	PAINTER	SCHOOL	OBSERVATIONS
CONSEQUENCES OF WAR. TWO LANDSCAPES. PORTRAIT OF POPE LEO X. PORTRAIT OF POPE JULIUS II. MADONNA D'ORI. MADONNA DEL' INFANATA. MADONNA DEL' GRANDECA. MADONNA DELLA SODALITA. MAST MAGDALEN. PEPPER AT EMMAS. CHARLES I. OF ENGLAND AND HIS QUEEN, HENRIETTA MARIA. THREE AGES OF MAN.	Rubens (1577-1640). Raphael (1483-1520).  Titian (1528-1588). Palma Vecchio (1480-1528). Van Dyke (1599-1641). Lotto (1480-1556).  Giorgione (1476-1511). Fra Angelico (1387-1455). Albrecht Dürer (1471-1528).	Flemish. Umbrian.  Venetian. Venetian. Flemish. Venetian.  Italian. Italian. German.	The last in the <i>Madonna of the Chair</i> and has long enjoyed a great world-wide popularity, being perhaps the best known of the many Raphael <i>madonnas</i> . It has been reproduced in engraving and color, in every possible medium, and has had an enormous sale through Europe and America.  A theme that has always had a fascination for painters.  A very human composition, with age to the left and a handsome youth in the center, attending the reading of a man of middle age. The three figures are said to be a portrait of Calvin, Luther and Melancthon. Naïve in both conception and rendering.

## XVII. In the Uffizi Gallery, Florence

HOLY FAMILY. LA FORNAINA.  PORTRAIT OF POPE JULIUS II. VIRGIN AT THE WELLS. BIRTH OF VENUS. VENUS AND THE GRACES. VIRGIN AND CHILD. JESUS WITH THE HEAD OF HOLOFERNES. ADORATION OF THE MAGI. THE ANNUNCIATION. PORTRAIT OF SIR ROBERT SOUTHWELL. PORTRAIT OF THE ARTIST. PORTRAIT OF ELIZABETH BRANDT. HENRY IV. AT IVRY. ADORATION. ENTOMBMENT. MADONNA ENTOMBED. MAN PRAYING. MADONNA. CORONATION OF VIRGIN. NAMING OF JOHN THE BAPTIST. MARRIAGE OF THE VIRGIN. THE ASSUMPTION. VIRGIN AND CHILD. VENUS.	Del Sarto (1486-1531). Del Piombo (1485-1547). Raphael (1483-1520). Botticelli (1446-1510).  Holbein (1497-1543). Rubens (1577-1640). Van der Werf (1659-1722). Van der Weiden (1400-1464). Memling (1430-1492). Fra Angelico (1387-1455).  Titian (1477-1576).	Florentine. Venetian. Umbrian. Florentine.  German. Flemish. Dutch. Flemish. German. Italian.  Venetian.	The figures of St. Francis and St. John are contained within the composition. This is said to be Del Sarto's masterpiece. This is a portrait of a very beautiful woman and for years was thought to have been by Raphael. A work most spiritual in its conception.  Both are world-famous portraits, of the first order.  Very naïve and full of great sincerity, in the manner of the Van Eycks.  In all a very comprehensive showing of the work of this interesting painter.  The Uffizi gallery contains portraits of artists painted by themselves at the request of the directors of the gallery, a distinguished honor that is not limited to men of Italian birth but includes the world's greatest artists, among them Rubens, Masaccio, Perugino, Raphael, Michelangelo, Leonardo da Vinci, Titian, Dürer, and other modern Europeans and Americans.
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## XVIII. In the Vatican Gallery, Rome

COMMUNION OF ST. JEROME. DEAD CHRIST AND MAGDALEN. FAITH, HOPE AND CHARITY. TRANSFIGURATION. CORONATION OF THE VIRGIN. ADORATION OF THE SHEPHERDS. CORONATION OF THE VIRGIN.  NATIVITY. MADONNA ENTOMBED WITH SAINTS.  VIRGIN OF ST. HELENA. MADONNA WITH ST. SEBASTIAN. ST. JEROME.	Domenichino (1581-1641). Raphael (1483-1520).  Murillo (1618-1682). Pisturicchio (1454-1513).  La Spagna (—1530). Perugino (1440-1524). Paul Veronese (1528-1588). Titian (1477-1576). Da Vinci (1452-1510).	Italian. Umbrian.  Spanish. Umbrian.  Umbrian. Umbrian. Venetian. Venetian. Florentine.	A famous work by a famous painter of altarpieces.  A very effective rendering of the theme. A fine painter who worked in "tempera," for he never mastered oils. His most famous work is a decoration for the library of the cathedral at Siena.  This artist was a pupil at the schools with Da Vinci, and was the master of Raphael, La Spagna and Pisturicchio.  Cardinal Feerch had only the head of the saint, which had been cut out of the wood panel, but the rest was found at a dealer's shop in Rome and joined together with the original.
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## XIX. In the Venice Academy

VIRGIN IN THE TEMPLE.  ASSUMPTION OF THE VIRGIN. THE ENTOMBMENT.  VIRGIN AND CHILD AND SENATORS. HOLY FAMILY, WITH ST. JOHN. PROCESSION IN ST. MARK'S SQUARE.	Titian (1477-1576).  Tintoretto (1518-1594). Paul Veronese (1528-1588). Bellini (1428-1516).	Venetian.  Venetian. Venetian. Venetian.	An old woman in the picture, selling eggs, is said to be a portrait of the mother of the artist. A grand work containing many figures. This was the last work of this great artist, begun in his ninety-ninth year and completed by Palma Vecchio.  An astonishing piece of realistic flesh painting. Highly interesting historically as showing the square as it existed in 1496.
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## XX. In the Vienna Academy

PORTRAIT OF MAXIMILIAN I. MADONNA AND SAINTS. HIMSELF AT FORTY-FIVE. HIMSELF IN AGE. YOUNG MAN IN ARMOR. CACCIGIONE. VIRGIN AND SAINTS. FAMILY OF VELLASQUEZ. A VENETIAN LADY.	Albrecht Dürer (1471-1528). Rembrandt (1607-1669).  Van Dyke (1599-1641). Van der Weiden (1400-1464). Paul Veronese (1528-1588). Velasquez (1599-1660). Titian (1477-1576).	German. Dutch.  Flemish. Flemish. Venetian. Spanish. Venetian.	Maximilian was a great patron of Dürer, though he did not invariably pay the artist's charges promptly. Rembrandt painted himself many times in various costumes.  Very sumptuous in the color and remarkable treatment of stuffs.
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**How to Look at Pictures.**—It is a mistake to suppose that age is any indication of the value of a picture. This is an error into which many laymen fall with the result that discouragement ensues because the work under consideration does not appeal. Indifferent work is by no means a monopoly of the modern painter. There have been poorly equipped craftsmen since the world began. But, because a picture is not immediately understood, is by no means to say that it is lacking. Art, like the study of literature or music, is a profound study, requiring the most serious application, investigation, research and experience. The average person prefers rag-time to the symphonies, nocturnes and grand compositions of musical masters, just as trashy reading appeals to the minds of the uncultivated. This is not, however, for a moment to admit that the works of the great composers and authors are not of higher importance than the meretricious tunes of the hurdy-gurdy, or the ephemeral novels of the day. But one, by a systematic course of study, can no train the ear and mind that only the best will satisfy in the end. And so it is with pictures. It is the story of all great collectors that their collections are gradually weeded out as their tastes improve and a higher standard is demanded.

Intuitively some minds are attracted to the best in art, as in music and literature. They are, however, the exceptions, not the rule. Even such minds are improved and strengthened by study and experience. The average man can only hope to achieve reasonable discretion in the matter of art by serious investigation and much sober reading. Some one has said that a work of art means a combination of two people—he who did it and he who looks at it. A picture is one man's conception of nature, and though twenty painters render the same subject, each according to his endowment and altogether differently from his fellow, each will be right, according to his convictions and power of transferring his thought to

canvas. For it is a matter of seeing, no less in the layman than in the artist, and one may be taught to see, as one may be taught to do other things. A good picture must say something; not necessarily tell some trite anecdote, or record some trivial incident, but must strive to convey some truth, even it be but the truth of humanity, as for instance in Titian's *Man With the Glove*, in the Louvre, one of the grandest portraits ever painted, or in the *Mona Lisa*, the most successful single figure piece ever offered to the world. In both cases the artists gave an epitome of the man and the woman of their day, and did so in the last terms of craftsmanship. Veronese gave the glory of color and the sumptuousness of apparel in his *Marriage at Cana*, which, as a record of the biblical event, was utterly false; but his genius carried it beyond facts and made of it a superb composition. The extraordinary piety in many of the older men among the Primitives atoned for other shortcomings, while the absolute and convincing sincerity of the Little Dutchmen, and their technical skill, made up for many a stupid composition.

A masterpiece must be all things to all men. You may have it dark in key, like a Ribera; glorious in light and shade, like a Rembrandt; full of poetry and graceful beauty, like a Raphael; colorful, like a Titian; elegant, like a Van Dyke; faithful and analytical, like a Holbein; unctuous and rich, like a Rubens, a poem in tone, like a Turner; or full of the glories of light and air, as a Monet, for each of these men had a mission to convey and he conveyed it seriously, earnestly, and according to the best that was within him. So when you stand before a canvas, seek first to know what was the object of the creator. If his aim was color, try to analyze his accomplishments in that direction; to portray the glory of out of doors, follow him there; or, if the human form attracted him most, endeavor to put yourself in touch with such an ambition on his part. And if at first there is no appeal, engage in a little introspection

and possibly you may discover the fault is your own, not that of the artist. But above all, approach a work of art, one that has stood the test of time, with reverence and the genuine endeavor to get the good, not the bad out of it, to get the viewpoint of the painter, and so to try and enter with him into his general trend of thought.

They have an inscription above the doors of the picture gallery at the South Kensington museum, in London. It reads, "That which has pleased a long and many must have some merit." It is advice to be remembered. Da Vinci, Botticelli, Rembrandt, Velasquez and the whole nobility of art are not where they are because of the critical opinions of the few, subject to changes of fashion, but because their art was founded on the eternal truths. They were great craftsmen as well, and they had something worth the world's listening ear, each in his own way, and each according to his own light; but it was always truth, the truth of humanity, nature, beauty—always truth. The spectator may not understand them, but the fault is not theirs, and it is up to the spectator to reorganize his point of view, for no ignorance, no stupidity, no false arguments, can for one moment dislodge truth, which despite all efforts yet remains as firm as the rock of ages—as truth, eternal, unassailable, inviolate. So, read of art. Listen to what the best judges have said about pictures. Get from these writers their point of view, the point of view of men who by study and experience are better qualified than you to judge, and so, in a humble spirit, and with a child's openness of mind, approach the work of these great men whom heaven has endowed with beauty of thought, precision of hand, and splendor of imagination. Do this reverently and with the genuine desire to learn, and the reward will be yours. It will repay a thousand fold, for if we may not all be creators, at least we may get an intelligent satisfaction from the creation of those more gifted, alas, than are we.

TABLE 1—POTTERY AND EARTHENWARE

COUNTRY	DATE	NATURE OF PRODUCT	REMARKS	COUNTRY	DATE	NATURE OF PRODUCT	REMARKS
Egypt	B. C. circa 3000	Unglazed pottery.	Household vessels, mostly wheel made.	Rome	B. C. 60	Dark ware with white decoration. Called <i>Castor</i> from the English locality.	The beginning of "slip" painting. It is a tinging scenes and scrolls.
Egypt	1900	Glazed stoneware.	Rich blue glaze. Figures and designs molded.	Rome	400	Samian ware from the island of Samos; also called <i>Aretine</i> .	Bright red glazed pottery. Molded with decorative scenes and scrolls.
Assyria	800	Unglazed pottery.	Utensils both hand and wheel made.	India	900 et seq.	Pottery of natural clay with colored glazes.	Wheel made. Decorated with floral arabesques under the glaze.
Assyria	700	Inscribed tablets.	Cylinders and slabs with impressed letters.	Japan	A. D. 200	Common pottery glazed and unglazed.	The art introduced by Korean pottery.
Babylonia	700	Unglazed pottery.	Primitive style. Simple bands of dark color.	Perla	1300	Erybre or slip coated pottery.	A natural dark clay covered or veneered with a white coating, colored and glazed.
Greece	800	Pottery both rough and polished.	Urnlike. Primitive style. Interlaced lines in dark color.	Perla	1200	So-called "Gombroon ware," attributed by some to the Chinese.	A porcelaneous earthenware of fine quality. Perforated and filled in with semi-transparent glaze. Sometimes decorated in blue.
Greece	700	Polished pottery, also called Mycenaean.	Wheel made. Archaic style. Birds and animals in blue, white, and black, the tails scratched in.	Syria and Arabia	1400	Erybre ware of the same general type as the Perla.	Decorated under the glaze with fine arabesques in color.
Greece	600	Polished pottery, also called Mycenaean.	Wheel made. In human figures in black, faces in profile, eyes fronting.	Rhodes and Asia Minor	1500	Erybre ware of the same general type as the Perla.	Characterized by the use of a red earth as a pigment.
Greece	500	Polished pottery. Red figured ware. Finest period.	Wheel made. Background in black, figures in natural color of clay. Faces and eyes in profile; drapery in detail. Figures and embossments in color.	Spain	1320	Tin enamelled ware, known as <i>Malolica</i> .	A dark natural clay covered with an enamel supplied by tin oxide. Lustrous and decorated in color.
Greece	400	Polished and ornamental ware. Decadent period.	Wheel made. Lines polished. Black color produced by smoke in burning.				
Rome	100 to A. D. 40	Black and gray ware, called "Uppchurch" from the English locality where much is found. Found in France and Germany.					



- 1. Persian Vase.
- 2. Japanese Sake-bottle.
- 3. Tiffin Vase.
- 4. Wedgwood.
- 5. Egyptian Mosaic Lamp.
- 6. French Earthenware.
- 7. Japanese Sake-bottle.
- 8. 18. French Vase by Daum.
- 9. Spanish Porcelain.
- 10. French Earthenware.
- 11. Ruby Glass.
- 12. Schaper Glass.
- 13. German Pottery.
- 14. French Earthenware.
- 15. 16. 17. Belgian.
- 18. Royal German, Berlin.
- 19. 20. 21. Royal German, London.
- 22. 23. 24. French Vase.

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TABLE I. POTTERY AND EARTHENWARE.—Continued

COUNTRY	DATE	NATURE OF PRODUCT	REMARKS	COUNTRY	DATE	NATURE OF PRODUCT	REMARKS
Italy	1350	Tin enameled ware, known as Majolica. A most extensive and important product which emanated from many centers.	Elaborately decorated in color and embellished with rich paintings. Lustered and sometimes with a brilliant overglaze.	China	618-907	Pure white hard porcelain (liang di nanyi).	The early porcelains were rather dark in color.
Italy (Luca della Robbia)	1450	Architectural modeled work coated with the characteristic tin enamel.	Luca della Robbia is believed to have greatly improved the quality of the enamel.	China	954	The first "celadon" porcelain.	This tint was called "the sky after rain" and was produced from iron.
Italy (Giorgio Andreoli)	1520	Ruby pots, dishes and platters.	The Maestro Giorgio worked at Gubbio and his ruby lusters are unique.	China	1368	Ming dynasty. The finest period.	The works of this time constitute the crowning glory of Chinese porcelain.
France (Nevers)	1580	Tin enameled ware in Italian style.	The maker of these wares came from Faenza, hence the term "faience."	China	1661	"Famille vert." (Jacquemart).	The porcelain was finished and glazed in the usual way, then decorated in black and covered with a fusible green enamel.
France (Rouen)	1540	Tin enameled ware of superior quality.	The style is entirely French. Figures and conventional ornaments.	China	1723	"Famille rose" (Jacquemart).	Overglaze decoration in which a rose color made from gold is the characteristic feature.
France (Moustiers)	1680	Tin enameled ware of superior quality.	Painted with hunting and domestic scenes on a very pure enamel.	Italy (Florence)	1580	A semi-hard porcelain with blue decoration.	The famous and rare Medici porcelain. Only 20 pieces are known.
France (Haut Deux)	1520	Glazed cream-colored pottery, inlaid with dark clay.	Also called Faience d'Oron from the supposed place of origin. A very rare and valuable ware; only 53 pieces are known.	Italy	1743	Soft porcelain.	Modeled figures colored over the glaze.
France (Valley)	1560	Light colored earthenware with richly toned glaze.	Modeled embossments of natural objects glazed in proper colors. Also some modeled figures.	Spain (Buen Retiro)	1760	Soft porcelain.	Removed from Capo di Monte when King Charles III. of Spain.
Germany	1840	Salt glazed stoneware.	Brown, gray or cream glazes, embossed and sometimes decorated in blue.	France (St. Cloud)	1695	Soft porcelain.	The first French porcelain and the first distinctive soft porcelain.
Holland	1600	Tin enameled pottery decorated in blue.	The well-known Delft ware.	France (Vincennes)	1745	Soft porcelain.	Vincennes was the forerunner of Sevres. In 1753 the king of France purchased one-third of the stock and gave the title "Royal" to the factory.
England	B.C. 400	Primitive hand-formed pottery.	Found in burial mounds used in funeral ceremonies. Crude and unglazed.	France (Sevres)	1756	Soft porcelain (pâte tendre).	Removed from Vincennes. In 1759 Louis XV. became sole proprietor.
England (Maltres and other places)	1250	Ecclesiastic tiles. Part-colored slays.	Made for church use, by the monks.	France	1760	Hard porcelain (pâte dure)	Kaolin or porcelain clay was discovered at St. Yrieix in 1768 and the production of hard porcelain followed. The pâte tendre was finally discontinued in 1804.
England (Tulham, Mortlake and Staffordshire)	1550	Salt glazed ware.	The knowledge derived from Germany.	France (Limoges)	1779 et seq.	Hard porcelain	The famous works of Hard and St. Yrieix, Puyat and others now manufacture very large quantities of the well known French china.
England (Staffordshire)	1610	Lead glazed pottery on colored slays.	Primitive in character. Either wheel made or shaped by hand.	Germany (Munich or Dresden)	1709	Hard porcelain.	No porcelain was made in Germany until the discovery of kaolin. Böttger was the first man to make hard porcelain in Europe.
England (Wootton and Staffordshire)	1620	Slip decorated ware.	A characteristic English product. Decorated with ornamentation in light-colored slips.	Germany	1718	Hard porcelain	Nearly every German prince desired a porcelain works during this period. There is not much to choose between the wares as regards quality, but the Dresden, largely over the glaze, bore different characteristics. Few of these factories are now in existence.
England (Lambeth, Staffordshire, Liverpool)	1635	Tin enameled ware.	Introduced from Holland.	Germany (Völsau, Aaspach, Bayreuth, Höchst, Fürstenberg, Berlin, Frankenthal, Nymphenburg, Ludwigsburg, etc.)	1758		
England (Staffordshire)	1680	Combed and marbled wares in parti-colored slays.	A domestic pottery largely made in cottage homes.	Denmark (Copenhagen)	1760	Soft porcelain.	This factory was closed in 1768. The paste is good and the making of excellent quality.
England (Etruria)	1762-1776	Wadsworth ware, queenware and Jasper.	The beginnings of modern manufacture.	Denmark	1772	Hard porcelain.	Became a royal manufactory in 1772. It is now noted as one of the first in the world.
England (Leeds)	1770	White earthenware.	Perforated and glazed.	England (Bow)	1744	Soft porcelain.	Bow was at one time called "New Canton." It is believed that bone ash was here first used in English china. The factory was closed in 1776 when Duesbury removed the equipment to Derby.
England (Staffordshire)	1784	Willow pattern, introduced by Spode.	Spode was the forerunner of the house of Copeland.	England (Chelsea)	1745	Soft porcelain.	Patronized by the king and the duke of Cumberland. The style of treatment was French. Purchased in 1769 by Duesbury and the equipment removed to Derby.
England (Lambeth (Doulton))	1818 (still working)	Stoneware.	A salt glazed ware, decorated in sgraffito and otherwise commonly known as "Doulton ware."				
England (Staffordshire (Furzevale))	The date of origin of these factories is unknown.		A fine quality of earthenware for table use.				
England (Staffordshire (Meakin's))			An excellent earthenware, largely in demand for table services.				
England (Staffordshire (Johnson's))			One of the best of the English earthenwares.				
China	Circa B.C. 165	The first hard porcelain.	It is quite uncertain when porcelain was invented; the Chinese themselves admit a much earlier date.				
China	A. D. 583	Hard porcelain, decorated under the glaze in blue.	The blue of cobalt is quite indestructible by fire and has been universally employed as a pigment.				

TABLE I. POTTERY AND EARTHENWARE—Continued

COUNTRY	DATE	NATURE OF PRODUCT	REMARKS	COUNTRY	DATE	NATURE OF PRODUCT	REMARKS
England (Derby)	1750 (uncertain)	Soft porcelain.	Derby was concerned in the making of china probably as early as 1745. In 1769 Duesbury combined with the Derby trust the resources of Bow and Chelsea. Hence the term, Chelsea-Derby.	England (Bristol)	1768	Hard porcelain.	Champion began to make porcelain in Bristol and in 1771 purchased the Plymouth patent. The works still exist, but for the production of earthenware only.
England (Derby)	1877	Bone porcelain and other wares.	Mr. Edward Phillips of the Worcester factory built the new 'Derby works' and began the manufacture of 'Royal Crown, Derby' porcelain. The factory now stands among the foremost in England.	England (Burslem (Doulton))	1840 (still working)	Bone porcelain, and other wares.	The factory of Pinder, Bourne, etc., was purchased by the firm of Doulton, Lambeth, and the work produced now ranks with the first of English wares.
England (Worcester)	1781	Soft porcelain. Ivory porcelain. Bone porcelain.	Founded by Dr. Wall and for a time occupied chiefly in producing Chinese patterns. Consolidated with Chamberlaine in 1840. The present company formed in 1862 and now manufactures the famous Royal Worcester wares.	England (Stoke-on-Trent (Minton))	1793 (still working)	Bone porcelain, earthenware and pottery.	Began as a manufactory of earthenware, & b a house of Minton, under the patronage of Campbell and J. Minton, took the lead in the well known Staffordshire potteries. The wares are of the finest.
England (Coalport)	1814	Soft porcelain. Bone porcelain.	The successor of Jackfield and Caughley. This factory is still in existence and produces fine wares.	England (Stoke-on-Trent (Copeland))	1779 (still working)	Bone porcelain, ironstone china and other wares.	Copeland was the successor to Spode. Considerable success has been achieved in all kinds of table services. Ceramical wares have been made also.
England (Plymouth)	1768	Hard porcelain.	This, the first factory in England for the manufacture of hard porcelain, was established by Coalworthy as a consequence of the discovery of porcelain clay in Cornwall. Removed to Bristol in 1771.	England (Causton Place (Brown, Weathered, Moore, etc.))	1794 (still working)	Bone porcelain and earthenware.	The present house is the successor of Ridgway & Sons. They are famous for china dinner wares.
				England (Wedgwood)	1767 (still working)	Bone porcelain and earthenware.	The original house of Wedgwood has taken up and developed all the modern styles with much success.

TABLE II. GLASS

LOCALITY OR COUNTRY	DATE	NATURE OF PRODUCT	REMARKS	LOCALITY OR COUNTRY	DATE	NATURE OF PRODUCT	REMARKS
Egypt	Circa B.C. 2400	Dark blue glass. Semi-opaque.	The earliest dated specimen is a small jar in the British Museum.	France	1400 to 1600	Utensils of various sorts colored and decorated. Window glass.	Small manufactures of glass existed in many parts of France but most of the product was unimportant.
Egypt (Nineweh)	1450 712	Transparent green glass. Pale green transparent.	A small vase in the British Museum bears the name of Layon, king of Assyria.	Spain	Circa 500 to 800	Cups, vials and bottles.	As in the case of France, the Roman influence was felt in Spain.
Greece or Phenicia	Circa 400	Colored glass. Waved, striated and sometimes carved.	Numerous small bottles. Beads and ornaments.	Spain	1400 to 1600	Utensils and drinking cups.	Some Spanish glass bears evidence of Venetian influence. Colored and reticulated forms are found.
Rome	Circa 30 B.C. to 309 A.D.	Common green glass. Colored and ornamental glass, carved, cut and woven glass.	Enormous quantities of glass of every description, even including window glass, were produced. The statements regarding early glass in China are very uncertain. But few specimens remain.	Germany	Circa 700	Drinking cups.	The influence of Rome is apparent here also.
China	Circa B.C. 140	Small vase ornamented and embossed.	Classical models were followed, but the wares of the period caused much interchange of plunder, and theories of many specimens is doubtful.	Germany	1400 et seq.	Steins and goblets. Window glass.	The stein was even then a feature in Germany. A great variety of form and treatment is found. Some highly ornate pieces are preserved.
Constantinople (Byzantium)	A.D. 800 to 1200	Heavy molded glass in dark colors. Some window glass.	Classical models were followed, but the wares of the period caused much interchange of plunder, and theories of many specimens is doubtful.	Great Britain	Circa 600	Beads, crude cups, window glass.	Both Roman and Saxon specimens are found. The original 'tumblers' was a glass drinking horn which could not be set down until empty.
Damascus and the East	1200 to 1400	Vessels of clear glass often richly ornamented.	Many lamps and vessels for religious use are found in mosaic.	Great Britain	1300 to 1600	Cathedral glass. Vessels of many sorts.	English stained glass for church windows is of the finest. The vessels were generally plain and useful.
Italy (Venice and (Urbino))	1090	Every description of fancy glass.	Glass mosaics preceded the general manufacture of glass in Venice. The furnaces were removed to Murano probably about 1300. Venetian glass is the model for the world.	Venice and Murano			
Italy (Murano)	1490	Millefiori glass.	This had been made by the Romans. Cases of colored glass cut into short lengths and these, with the cut ends showing, were fused into the body of the vessel.	France			
Italy (Murano)	1600	Vetro di Trina (lace glass).	Transparent opaque white glass were fused in a geometric pattern into the clear glass of the vessel.	Bohemia			
France	A.D. Circa 800 to 800	Glass vessels.	Scarcely any specimens remain. The work was probably of Roman origin.	Germany (Jena)			
				England			
				America			

## MODERN PRODUCTIONS

The glass made is much on the old style. Every description of colored, blown, woven and reticulated glass is produced. The material is still of the lime-soda mixture.

A great deal of modern French glass is crystal of the lead-oxide compound. The molded glass is very fine. Some French craftsmen have produced wonderful effects in color. The glass is well known in the small and inexpensive variety-brass of the stores. A good deal of it is decorated in color and gold.

In optical and chemical glass the Jena works lead the world.

The English glassmakers are surpassed by none. Table glass of pure crystal, cut glass and ornamental pieces are made in great variety. The Stourbridge district is the most famous.

Much of the American glass is molded in the form of tumblers and household vessels. Fine cut glass is made at Cortez, Toledo and other places. Plate glass is an important part of the industry.

**RELIGION** is the feeling of reverence which men entertain toward a supreme being or to any order of beings conceived by them as demanding reverence from the possession of superhuman control over the destiny of man or the powers of nature; more especially the recognition of God as an object of worship, love, and obedience.

Religion, as distinguished from *morality*, denotes the influences and motives to human duty which are found in the character and will of the deity, while morality is concerned with man's duty to his fellows. As subjective from *theory*, religion is distinguished, inasmuch as it relates to the feelings; while *theory* is objective, as it denotes the system of beliefs, ideas or conceptions which man entertains respecting the God whom he worships.

Various estimates have been made of the diffusion of the different religious creeds over the world. These are necessarily very loose and often differ widely from one another. A recent estimate is the following:

CREEDS	No. of Followers
1 Christianity.....	477,080,158
2 Worship of ancestors and Confucianism.....	256,000,000
3 Hinduism.....	192,000,000
4 Mohammedanism.....	176,834,372
5 Buddhism.....	147,500,000
6 Taoism.....	43,000,000
7 Shintoism.....	14,000,000
8 Judaism.....	10,186,000
9 Polytheism.....	17,681,669

CHRISTIANITY	Total Followers
Catholic church.....	230,866,523
Protestant churches.....	143,237,625
Orthodox Greek church.....	98,016,000
Church of Abyssinia.....	3,000,000
Armenian church.....	1,890,000
Coptic church.....	120,000
Nestorian.....	100,000
Jacobites.....	70,000

**Christianity** is the religion instituted by Jesus Christ, and the Christian church consists of his followers. Its first great increase was at Pentecost, when three thousand were converted and shortly afterward five thousand were added to the church. Stephen was the first to suffer martyrdom. Paul made three great missionary tours, and the result was the unity of the church in its first period. **Ancient Period, A. D. 30-750.**—The first part of this period was distinguished by great simplicity of doctrine and life, and real in extending the kingdom of Christ. Important centers were established, and the gospel was largely confined to the middle and lower classes. Controversies arose between the gentile and Jewish Christians, but not to such an extent as to arrest steady progress. The heretical sects, with Saturninus, Basilides, and others at their head, were of no serious injury. The chief defenders of Christianity were Aristides, Justin Martyr, Melito, Tatian, and Hermas.

This was the time of great persecutions. There were ten in all; the most serious being under the emperors Nero, Decius, and Diocletian. The scriptures were collected into a canon, and the church made great advance in numbers and territory. The most important writers were Ignatius, Irenaeus, Origen, Tertullian, and Clement of Alexandria. The more serious schisms were produced through Pelagius, Novatus, and Miletus. The doctrinal controversies related chiefly to eschatology, human depravity, and the divinity of Christ.

**The Council of Nicea, in A. D. 325,** was a great triumph for orthodoxy. It declared the essential trinity of the godhead, and settled

for all time the divinity of Christ as a fundamental doctrine of Christian faith. The heresy of Arius was condemned. Persecution ceased, through the sympathy of the Emperor Constantine, who, in 313, removed all disabilities from Christians, and in 325 made Christianity the state religion of the Roman empire. Monasticism, a reaction against worldlyness, increased rapidly. Julian the Apostate endeavored to revive paganism, but without avail. Leo the Great, bishop of Rome, extended the authority of the western church in opposition to the claims of the patriarch of Constantinople.

**Mohammedanism** paralyzed the eastern church for a time. Its leaders conquered all northern Africa, western Asia, and gained a foothold in Spain, and the south of France; but it was finally arrested in western Europe by Charles Martel, by the victory of Tours, in 732.

**Gregory the Great, bishop of Rome, ruled from 590 to 604.** He greatly extended the power of the Roman church, organized monastic orders, elevated the church festivals, and reformed purgatory as a Roman church doctrine. He organized a mission among the Anglo-Saxons. The gospel spread rapidly through Britain and Germany. Christian art was patronized liberally by the Roman bishops. The close of the ancient period found the Latin, or western church, very vigorous and aggressive, but the eastern church in a stagnant condition.

**Medieval Period, A. D. 750-1517.**—This period falls into three great divisions—from Charlemagne to Gregory VII. (750-1073); from Gregory VII. to removal of papal see to France (1073-1305); from removal of papal see to Reformation (1305-1517). The middle ages were the transition from the ancient to the modern period.

The most important political events, all of which had a bearing on the church, were the end of the Greek exarchate in Italy, the destruction of the Lombard kingdom, the organization of the Frank empire under Pepin, rise of the new Germanic church, division of the Mohammedan caliphates, decline of the Greek empire, and development of the new Roman empire in the west.

**Charlemagne** was the greatest mediæval ruler. He was victorious over many northern tribes, and increased the territory of the church to vast proportions. He was a liberal patron of learning, and authorized a Latin version of the scriptures. Alfred the Great of England reigned from 871 to 901, and was distinguished for learning as for his power to rule. The Russian monarchy was founded by Rurik, in the middle of the ninth century. At this time, evangelization of heathen nations progressed rapidly. The Hungarians, Bulgarians, Bohemians, Moravians, Wends and Scandinavians accepted Christianity.

**Crusades.** The violent rule of the Mohammedans over Palestine excited the wrath of western Europe, and crusades were organized for the rescue of the country from the Moslems. There were seven crusades, extending from 1096 to 1272. Christian Europe failed, finally, to hold the country, but the general effect of the crusades was beneficial to Europe in the development of commerce, introduction of oriental thought, and the growth of liberty. **Reformatory Movements** were inaugurated through the Waldenses (1170), Wycliffe (1324), John Hus (1373), the Moravian Brethren (1417), the Mystics (Tauler, Suso, Ruysbroek, Groot, Thomas à Kempis), and Savonarola (1480-97). Mendicant orders were established. The Inquisition, established to arrest reform, was decreed in 1215.

**The Modern Period, 1517-1880.**—Martin Luther began the Reformation by publish-

ing ninety-five theses against Rome. He translated the scriptures into German, gained the cooperation of the German princes, and published sermons and other works against the errors of Romanism. Melancthon was the chief doctrinal writer of the Reformation. Erasmus labored in the department of New Testament criticism. The leading Swiss reformers were Zwingli in East Switzerland and Calvin in the west. Farel stood next to Calvin in Geneva.

**The English Reformation** had King Henry VIII. on its side, through no pious motives, but because the pope would not sanction his frequent marriages. This was the great opportunity for which the reformers of England had been waiting. Protestant sentiment grew rapidly. Ridley, Latimer, Cranmer, Hooper and Taylor fell victims to Queen Mary's religious seal. Under Elizabeth the Reformation was placed on a firm foundation.

**The Puritans** were a reaction against Romanism and sympathy with it in the church of England. They persevered, under Cromwell, the liberties of the English nation.

Arminius, in Holland, opposed the chief tenets of Calvinism. The spread of Dort resulted in the political triumph of the Calvinists, and the expulsion of the Remonstrants, until the death of Maurice (1630). The Thirty Years' war (1618-48) was confined to the continent, and established the territorial boundaries of the Protestant and Catholic nations. The Huguenots of France were persecuted. 1572, and 70,000 people were killed on St. Bartholomew's night. The Jesuits, organized by Ignatius Loyola, 1540, were established as an offset to the aggression of Protestantism.

**Deism** prevailed to an alarming extent in England, its chief promoters being Hobbes, Herbert, Shaftesbury, Tindal, Bolingbroke, Hume and Gibbon. They had strong antagonists in Baxter, Cudworth, Taylor, Waterland, Leland, Butler and Paley, but the general condition of the people was irreligious.

**Methodism**, which arose from John Wesley, was a fervent religious movement. Charles Wesley, Whitefield, John Fletcher, Joseph Benson and Adam Clarke were strong coadjutors.

**German Rationalism** arose in 1750, through the teachings of Wolf and Semler and the example of the Prussian court. It then declined, through the labors of Tholuck, Naender, Hengstenberg, Ullmann, and others.

**The Evangelical Alliance** has promoted the unity of orthodox Christians in all parts of the world, and, to a corresponding degree, the victory over skepticism. The Old Catholics, a Roman church reaction against the vatican council of 1869, were organized into a church in 1870, with Dollinger, Huber, and Friedrich at their head. They have made great progress in certain parts of Germany and in Switzerland.

**The American Church, A. D. 1807-1911.**—The colonization of North America sprang from religious motives. The colonists sought freedom here because of oppressions at home. **Periods of American Church History.**—1. From 1607-60, revival and progress. 2. 1660-1720, trial, disputes with Great Britain, religious decline. 3. From 1720-50, great revivals. 4. From 1750-83, political agitation, freedom from British rule. 5. From 1783-1911, extensive revivals, separation of church and state, abolition of slavery, evangelization.

The following tabulation, prepared by the joint effort of eminent authorities representing the various denominations, gives an exhibit of the present religious status of the United States.

## CHIEF RELIGIOUS BODIES OF THE

NAME OF DENOMINATION	WHEN AND WHERE FOUNDED AS AN ORGANIZED BODY	BY WHOM OR HOW	NUMBER OF CHURCHES
<b>Adventists</b>			
Evangelical	Albany, N. Y., 1845	Rev. William Miller	18
Advent Christians	Boston, Mass., 1861		550
Seventh-Day	Battle Creek, Mich., 1845		1,817
Church of God	Sanberry, Mo., 1865		30
Life and Advent Union	New York City, 1848		12
Churches of God	Philadelphia, 1888		62
<b>Baptist</b>	Outgrowth of long period and of widespread anti-pedobaptist, anti-Romanist movements. Name first used (apparently) in 1644. English Baptist history distinct after 1641.	No single founder	
Northern	In 1844	Due to anti-slavery agitation	9,239
Southern	New Hampshire, 1780	Separated from regular Baptists because of close communion.	21,587
Freewill	Newport, R. I., 1671	Nicholas Brood—Separated from the Baptists in England, and observed the seventh day.	1,926
Seventh-Day		Alexander Mack—Originated in Germany, 1708, in Westphalia, at Schwesau. Called by themselves Old School Baptists, having no missions, Sunday-schools, or educative institutions.	82
Dunkers, German Baptist	Pennsylvania, 1719	John Winebrenner—Winebrenner was previously a minister of the German Reformed church in Harrisburg.	1,188
Primitive			2,922
Church of God	Pennsylvania, 1830		48
Colored, regular			
Church of Christ, Scientist	Founded in Boston in 1879	Mrs. Mary Baker Eddy	17,429
			721
<b>Congregational</b>	The Congregational church was founded in Scroby, England; emigrated to Leyden, Holland; came across the Atlantic to the Mayflower, and began its life in America December 22, 1620. This was the beginning of Congregationalism in America.	"By the apostles in Jerusalem." Congregational (independent) church originated in England in 1555.	14,166
<b>Disciples of Christ or Christians</b> (Church of Christ or Christian Church)	First congregation at Brush Run, Pa., May 4, 1811. The movement was merged with the Baptists in 1813, but a separation occurred in 1830, and it has been an independent body since that time.	The movement was led by several men, the chief among whom were Thomas Campbell, Alexander Campbell, Barton W. Stone and Walter Scott.	11,490
<b>Friends</b>	North Carolina, 1672	George Fox—Fox began his work in England in 1647, and spent two years in America.	830
<b>Orthodox Hekata</b>			211
<b>Jewish Church</b>	At Ur, in Chaldea, about twenty-first century B. C. to America, by Synagag Teah Israel, Newport, R. I., 1658.	Abraham	1,770
<b>Latter Day Saints or Mormons</b>	Fayette, N. Y., 1830	Joseph Smith	1,380
<b>Lutherans in the United States</b>	Hagerstown, Md., 1820	From a number of scattered congregations traceable to the original society founded in New Amsterdam, by Jacob Fabricius, in 1609.	12,762
1. General Synod of the Evangelical Lutheran Church in the United States of America.	Hagerstown, Md., 1820		1,746
2. United Synod of the Evangelical Lutheran Church in North America.	Roanoke, Va., 1866		481
3. General Council of the Evangelical Lutheran Church in North America.	Pt. Wayne, Ind., 1867		2,393
4. Evangelical Lutheran Synodical Conference of America.	Milwaukee, Wis., 1872		3,278
5. United Norwegian Lutheran Church in America.	Miocepollis, Minn., 1890		1,415
6. Evangelical Lutheran Joint Synod of Ohio and other states.	Somerset, Ohio, 1818		760
7. Lutheran Synod of Buffalo.	Milwaukee, Wis., 1845		44
8. Hauge's Norwegian Evangelical Synod.	Jefferson Prairie, Wis., 1846		286
9. Evangelical Lutheran Church in America, Eielson's Synod.	Jefferson Prairie, Wis., 1846		26
10. German Evangelical Lutheran Synod of Texas.	—, Texas, 1851		25
11. Evangelical Lutheran Synod of Iowa and other states.	St. Sebald, Iowa, 1854		708
12. Synod for the Norwegian Evangelical Lutheran Church in America.	East Koahkonong, Wis., 1853		621
13. Evangelical Lutheran Synod of Michigan and other states.	—, Mich., 1897		55
14. Danish Evangelical Lutheran Church in America.	Neenah, Wis., 1872		122
15. Icelandic Evangelical Lutheran Synod in North America.	Mountain, N. D., 1885		14
16. Immature Synod of the Evangelical Lutheran Church of North America.	Wall Rose, Pa., 1885		11

## UNITED STATES, TABULATED

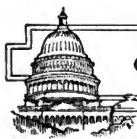
NUMBER OF ADHERENTS	NUMBER OF CLEBY	VALUE OF CHURCH PROPERTY	FORM OF GOVERNMENT	CENTRAL DOCTRINE BELIEF STATED
481	8		Congregational, excepting the Seventh-Day Adventists, who are Presbyterian; they are organized in local and general conferences and hold annual meetings, often in connection with camp-meetings.	The bible is their creed, which they accept as inspired; the second coming of Christ; observance of the seventh day of the week as Sabbath; all fundamental doctrines of the Christian system, except a millennial era prior to Christ's advent.
26,799	526			
61,427	519			
611	32			
509	12			
2,124	56	\$133,530,000	Democratic, local churches formed into associations, with general denominational conventions.	Supremacy of bible in faith and practice; churches independent; church membership dependent on regulation and immersion; anti-sacramentarian; generally Calvinistic; priesthood of individual believers; liberty of conscience and denial of all final religious authority except that of Jesus Christ.
1,176,380	8,095			
2,130,680	13,555			
114,114	1,598			
8,339	96			
122,847	3,412			
102,311	1,500			
1,823	75			
1,874,261	12,602			
Not tabulated, hence indefinitely known.	Each church has two readers in lieu of a pastor	Approximately 9,000,000	The existence of branch churches is provided by the rules and regulations of the mother church, and the mother church stipulates the form of service, but each branch church is independent of the mother church as regards its business affairs.	Christian Science plants itself unreservedly upon primitive Christianity as taught and exemplified by Christ Jesus. Its cornerstone is the scriptural teaching that God is Spirit and is the only power.
1,373,557			Democratic. The local church is autonomous; the fellowship of the churches brings them together for cooperation in Christian work.	Protestant evangelic
1,364,000	6,399	30,364,000	Congregational. The minister, elders and deacons usually constitute the official board, through which body the business of the congregation is often transacted, though matters of importance are sometimes brought before the congregation.	Sovereignty of God; divinity of Christ; the indwelling power of the Holy Spirit and its agency in conversion; Old and New Testament scriptures as the inspired word of God; the future punishment of the wicked and the future reward of the righteous; the institution of the Lord's supper for all the Lord's children; finally, the personal Christ as its only creed, and the bible as its only rule of faith and practice.
96,000	1,341		Independent Congregational.	Evangelical; the "inner light" or "grace of God" is the cardinal point of belief.
19,545	96			
145,000	1,100		Congregational	The unity of God. Rejects doctrine of original sin. Salvation for all through repentance and good works. Moral consecration and social righteousness. Rejects eternal punishment. Israel, God's chosen people.
400,650	2,483	3,500,000	Apostolic. Two orders of priesthood exist—the higher that of Melchisedek, the lower that of Aaron. To the former belong apostles, sevens, high priests, elders, patriarchs; to the latter, bishops, priests, teachers, deacons. The first presidency (i. e., the president of the church and two counselors) forms the highest authority, followed by the twelve apostles and sevens—a hundred councils of seventy each. These bodies supervise generally the church, which locally is organized into fifty stakes, further subdivided into wards. Each stake has a president and two counselors; each ward a bishop, teachers, and deacons.	The Book of Mormon and Doctrine and Covenants form the basis of a belief which looks for a continuance of revelation and miracles, an American Zion, a millennium, and the palingenesis of earth under Christ's rule. Other Mormon tenets are universal tolerance of other faiths, the literal resurrection of the body, baptism by immersion, and (by proxy) of the dead.
2,207,133	8,458	83,513,500	Modified Presbyterian	Justification by faith alone in the merit and righteousness of Christ; atonement; eternal rewards and punishments; Christ very God and very man. In the eschatist the belief of the Lutherans is known as consubstantiation.
284,808	1,320	18,344,453	1. Modified Presbyterian	The doctrinal system of the Lutheran church is contained in the Augsburg Confession and other documents, including the two catechisms of Luther.
49,374	240	1,714,140	2. Modified Presbyterian	
471,563	1,565	23,288,909	3. Modified Presbyterian	
735,866	2,620	22,000,000	4. Modified Congregational.	
100,845	525	3,658,588	5. Modified Presbyterian	
120,031	570	4,797,560	6. Modified Congregational	
5,370	27	130,000	7. Modified Presbyterian	
36,357	148	682,135	8. Modified Presbyterian	
1,043	6	15,900	9. Modified Presbyterian	
2,440	19	30,050	10. Modified Presbyterian	
110,360	500	3,713,944	11. Modified Presbyterian	
107,712	359	2,469,713	12. Modified Presbyterian	
9,997	37	184,700	13. Modified Congregational	
12,541	64	248,700	14. Modified Congregational	
4,656	13	126,252	15. Modified Presbyterian	
3,378	12	89,300	16. Modified Congregational	Cardinal doctrines of minor Lutheran denominations are practically the same.

## CHIEF RELIGIOUS BODIES OF THE

NAME OF DENOMINATION	WHEN AND WHERE FOUNDED AS AN ORGANIZED BODY	BY WHOM OR HOW	NUMBER OF CHURCHES
<b>Lutherans</b> —Continued			
17. Finnish Evangelical Lutheran Church of America, or Suomi Synod.	Columet, Mich., 1890		122
18. Norwegian Lutheran Free Church.	Minneapolis, Minn., 1893	The number of separate church organizations is due to difference of language rather than to difference of doctrine.	325
19. United Danish Evangelical Lutheran Church in America.	Minneapolis, Minn., 1896		198
20. Slovak Evangelical Lutheran Synod of America.	Braddock, Minn., 1902		59
21. Finnish Evangelical Lutheran National Church.	Ironwood, Mich., 1900		43
22. Apostolic Lutheran Church (Finnish).	—, 1872		68
23. Church of Lutheran Brethren of America (Norwegian).	Milwaukee, Wis., 1900		16
24. Evangelical Lutheran Jehovah Conference.	—		9
<b>Mennonites</b>	Lancaster Co., Pa., 1683	By invitation of Wm. Penn. Name derived from Menno Simon, who preached in Friesland.	606
<b>Methodist</b>	At Oxford, England, 1729; in America by Thomas Coke, under deputation by Wesley, Baltimore, 1784.	John Wesley and a group of Oxford students.	
Methodist Episcopal	Baltimore, 1784	John Wesley—Mr. Wesley deputed Dr. Thomas Coke as superintendent or first bishop to organize a separate church.	28,325
Methodist Episcopal South.	Louisville, Ky., 1845	By the separation of the church in the South under separate jurisdiction.	16,757
Methodist Protestant	Baltimore, 1830	By separation from M. E. church at a convention formally opened Nov. 2, 1830.	2,380
American Wesleyan	Utica, 1843	By separation from M. E. church, separate societies were organized in 1845.	255
African Methodist Episcopal	Philadelphia, 1816	Richard Allen—By withdrawal of colored members into separate organizations.	5,483
African Methodist Episcopal Zion	New York, 1816	Christopher Rush, first president—By withdrawal of Zion church congregation from M. E. church: first conference held 1821.	3,291
Colored Methodist Episcopal in America	—, 1874	By separation of most of the colored members from M. E. church South.	2,800
Evangelical Association	Pennsylvania, 1800	Jacob Albright—Composed of German Methodists and those who are followers of Albright.	2,678
Free Methodists	Western New York, 1860	Benjamin T. Roberts—By separation from Methodist Episcopal church.	1,132
<b>Moravians</b>	Near Savannah, Ga., 1736	Anthony Seiffert—Established by Count Nicholas de Zinsendorf, at Herrnhut, in Saxony, 1722.	142
<b>Presbyterian</b> Northern	Philadelphia, Pa., March, 1706	Seven ministers, the leader, Rev. Frances McKim.	9,907
Southern	Augusta, Ga., 1861	Cumberland Presbytery—By separation of the southern churches from the northern at the opening of the Civil war.	3,217
Cumberland Presbyterian	Tennessee, 1810	Chiefly because the old church refused to allow nongraduates to be ordained to the ministry.	1,465
Colored Cumberland Presbyterian	—	By peaceful separation of the colored church from the old body.	196
United Presbyterian	South Carolina, 1858	By union of the Associate and Associate Reformed churches.	980
Associate Reform Synod of the South	—, 1802	By those in the south who declined to unite with the new organization.	158
<b>Protestant Episcopal</b>	Became independent of the church of England in 1789.	On account of the change of government the church which came with the colony of Jamestown, 1607, adopted a constitution of its own.	8,017
<b>Reformed</b>		Reorganization of Anglican church, which became fragmentary and scattered.	
Reformed Episcopal Church	New York, 1873	Bishop G. D. Cummins—By separation from Protestant Episcopal church.	80
Reformed (Dutch) Church	New York City, 1619	By ministers sent from Holland by request of Governor Minuit.	684
German Reformed Church	Pennsylvania, 1727	Geo. Michael Weiss—The first church was composed of about 400 Palatines from Europe.	1,737
<b>Roman Catholic Church</b>	Pentecost day at Jerusalem	Jesus Christ	13,304
<b>Salvationists</b>	London, England, 1865; United States, 1881	William Booth	909
<b>Unitarians</b>	Boston, 1783	James Freeman—By self transfer from the Anglican church.	504
<b>United Brethren</b>	Pennsylvania, 1800	Philip W. Otterbein—Composed chiefly of Germans at first, Methodist in doctrine and policy.	4,311
<b>Universalists</b>	Gloucester, Mass., 1779	John Murray—Under name of "The Independent Christian church." Murray had been a Methodist in Ireland.	890

## UNITED STATES, TABULATED—Continued

NUMBER OF ADHERENTS	NUMBER OF CLERGY	VALUE OF CHURCH PROPERTY	FORM OF GOVERNMENT	CENTRAL DOCTRINES BRIEFLY STATED
13,656	26	\$204,000	17. Modified Presbyterian	See page 375.
30,000	161	660,310	18. Strictly Congregational	
16,340	114	569,500	19. Modified Presbyterian	
12,141	22	219,300	20. Modified Congregational	
10,111	16	95,150	21. Modified Presbyterian	
8,170	78	62,856	22. Modified Congregational	Similar to Reformed church.
482	7	16,400	23. Modified Presbyterian	
735	9	21,550	24. Modified Congregational	
85,007	1,008		Independent Congregational	
		230,000,000	Episcopal. The general law-making bodies are: The General Conference; the Judicial Conference; the Annual Conference; the District Conference; the Quarterly Conference; and the Ladies and Stewards' Meeting.	Armenian or evangelical as distinguished from Calvinistic. Wesley thus defines the doctrine of the deamination: "The points we chiefly insisted upon were four: "First, that orthodoxy, or right opinions, is at least but a very slender part of religion, if it can be allowed to be any part of it at all; that neither does religion consist in negatives, in bare harmfulness of any kind, nor merely in externals, in doing good, or using the means of grace, in works of piety or of charity; that it is nothing short of or different from 'the mind that was in Christ,' the image of God stamped upon the heart, inward righteousness attended with the peace of God, and 'joy in the Holy Ghost.' "Secondly, that the only way under heaven to this religion is to 'repent and believe the gospel'—or (as the apostle words it), 'repentance toward God, and faith in our Lord Jesus Christ.' "Thirdly, that by this faith 'he that worketh not, but believeth on Him that justifieth the ungodly, is justified freely by His grace, through the redemption which is in Jesus Christ.' "And, lastly, that, 'being justified by faith,' we taste of the heaven to which we are going; we are holy and happy; we tread down sin and fear, and 'sit in heavenly places with Christ Jesus.'"
3,159,913	18,160		Wesleyan Methodist ministers change their circuit every three years, save under exceptional circumstances. Several unsuccessful attempts have been made to alter this rule, and there is a growing conviction that the term should be extended. Lay or local preachers fill an important place in Methodism, the pulpits in many villages being almost wholly occupied by them.	
1,780,778	7,287			
188,122	1,348			
18,500	138			
452,126	6,353			The Moravian Church does not differ from other evangelical churches, so far as the main points of Christian belief are concerned. On minor points it allows a difference of opinion.
545,681	3,421			
233,311	2,863			
180,315	1,517			
32,166	1,104			
18,343	137		The entire body of Moravians is organized into three provinces, German, English, and American, governed from Herrnhut, Germany, by a general synod which meets decennially.	Holds to the theological system known as the Calvinistic. Unconditional sovereignty of God; the Holy Spirit, the only infallible rule of faith and life, the supreme headship of Christ; the equality of believers and the parity of the ministry.
1,311,828	8,916	181,000,000	Presbyterian, i. e., by a body of presbytery or elders elected by the various church organizations, together with the clergy. It claims to reproduce the forms of the apostolic age, and to safeguard the church against passing prejudice on the one side and against prelatical assumption on the other.	
269,733	1,625			
75,000	657			
18,000	275			
132,925	905			The Trinity, the Incarnation, and the Atonement.
13,400	117			
929,117	5,516	125,000,000	Episcopal	
		31,000,000	Reformed Churches, those bodies which are in their standards and confessions markedly Calvinistic, and which, generally speaking, adhere to the presbyterianial in preference to the episcopal form of church government.	
9,610	91			
116,174	727			In doctrine, Reformed churches adhere to the Heidelberg catechism, and are, therefore, Calvinistic.
293,836	1,230			
14,619,000	16,550	300,000,000	Organized society with power to teach and govern from Christ. Composed of Roman Catholic colonists from England. L. Calver's father, Lord Baltimore, was a convert from the Anglican Church.	
27,286	3,326	3,500,000	Military, organized into corps, officers, and corporals. The work of evangelization is effected through rescue houses, slum posts, prison brigades, food depots, shelters for the destitute, labor houses, labor bureaus, etc., and open air services.	
75,000	538	15,400,000	Congregational	
304,686	2,177	9,000,000		The fatherhood of God; the brotherhood of man; the leadership of Jesus; salvation by character; the progress of manhood upward and onward forever.
54,836	730	11,000,000	Congregational	



## GOVERNMENT AND LAW

### GOVERNMENT OF THE UNITED STATES

**Origin and Development.**—1. The fundamental fact about the government of the United States is that it forms a federal state, a union which has developed from separate colonies or territories. The colonies, from the geographical conditions of climate and soil and from varying circumstances under which they had been settled, differed greatly from one another both in type of government and in social conditions. In New England they had settled in villages with a church, and the form of government was popular, the town-meeting type, the meeting deciding policies and electing men to carry them into effect. In Virginia, owing to the ease of traffic by water courses and to the nature of their agricultural products, tobacco and others adapted to cultivation on a large scale, great estates had been formed, the government was not popular, but by the gentry speaking for all and in counties rather than in towns. Elsewhere either one of these or a later type combining the two was adopted.

In relation to the mother country the colonies differed, two (Connecticut and Rhode Island) having received charters which enabled them to choose their governors; others (Pennsylvania, Maryland, Delaware) having their governors appointed by the proprietor who had received the grant of land and power from the crown; while the governors of the other eight were appointed directly by the king and were responsible to him.

The pressure of danger from the Indians, the Dutch and the French, and later from the mother country, with the disadvantages of inharmonious action on commercial matters and the benefits and power to be derived from uniform regulations and united action, led by a series of steps to a firm united state, of which the form was adopted largely from the governments of Great Britain and of the different states that had been formed from the colonies in 1776 and the following years after the separation from Great Britain.

2. **Important Steps Toward Union.**—(a) From 1643 to 1684 Massachusetts Bay, New Plymouth, Connecticut and New Haven colonies formed the New England Federation to strengthen their defense against the Indians, Dutch and French, representatives being sent from each. After that in time of need intercolonial conferences were held from time to time.

(b) In 1754 a Congress of twenty-five members from seven colonies met at Albany to arrange a treaty with the Iroquois Indians and to consider other common interests. The Congress adopted Franklin's plan for a permanent federation, but it was rejected by all the colonies.

(c) In 1765, in consequence of the passage of the Stamp act in Great Britain, at the instance of the Massachusetts house of representatives nine colonies sent representatives to the Stamp Congress at New York, which issued a declaration that the rights of natural born English subjects

belonged to the colonists and framed petitions to the English government for relief.

(d) Further acts of England, especially the *Committees of Correspondence* among the colonists, who thus fostered unity of sentiment against England and for their common interests.

(e) *The First Continental Congress* was called by Massachusetts in 1774 when the English government passed the acts providing for the coercion of that colony. All the colonies except Georgia sent delegates to Philadelphia, who drafted the Declaration of Rights of the colonies, adopted articles of association, advised resistance, and provided in case of need for the meeting, May 1775, of the Second Continental Congress.

(f) *The Second Continental Congress.*—This met, delegates from all the colonies being present. In the meantime England had passed other measures of coercion, and in attempting to seize the war supplies of the colonists, had brought on the battle of Lexington. It therefore became necessary for the Congress to make provisions for continuing resistance. In fact it became a governing body, and with adjournments from time to time, until May 1, 1781, it directed the war of the Revolution, and really organized and managed a new state. It issued the Declaration of Independence, recommended the colonies to provide for themselves state governments, instituted relations with foreign countries and did other needed work.

(g) *The Articles of Confederation*, first sketched out and presented by Franklin July 21, 1775, after long delays and many amendments, were adopted by the last state, Maryland, March 1, 1781. The desire of each state to control its own affairs, the lack of experience of the difficulties of separate action and of the consequent need of a central body which had the powers necessary to secure harmony, resulted in leaving the government so weak and ineffective that only the overwhelming needs of war time at first secured harmony. Later, disputes and hostile interests, especially commercial, brought the country to the verge of civil war.

(h) A meeting of commissioners from Maryland and Virginia in 1785 to discuss a commercial dispute led Virginia to call a meeting of delegates of all the states at Annapolis in 1786 to consider commercial relations. Representatives of only five states came, but among them were several far-sighted statesmen, and before adjourning they adopted a resolution offered by Alexander Hamilton calling a convention to amend the Articles of Confederation.

(i) *This Constitutional Convention* met at Philadelphia May 25, 1787. Representatives of all the states except Rhode Island were present, among them the most noted and ablest men of the time. Different plans were proposed, important compromises, especially to settle controversies

between large and small states and those concerning slavery, were made, and at length the Constitution was adopted and signed September 17, 1787.

(j) It was then submitted to Congress and by it sent to the states to be ratified. On June 21, 1788, New Hampshire, the last of the nine states whose ratification was needed, adopted it. The last state, Rhode Island, ratified it May 29, 1790. Congress provided an act by which it went into operation in 1789.

(k) *Amendments.*—To satisfy the wishes of several of the states, a Declaration of Rights was provided in the first ten amendments, which were ratified by the state legislatures soon after the adoption of the Constitution. Amendments XI and XII were passed to settle practical difficulties in administration, while Amendments XIII, XIV, and XV were passed to clinch the results of the Civil war on the question of slavery.

**The Federal Government.**—I. **Congress; General Powers.**—The Congress which has been elected under the Constitution as the law-making body consists of the Senate and the House of Representatives and has several general powers granted it: To pass laws, to judge the elections and qualifications of its own members, to determine its own rules of procedure, to lay and collect taxes, duties, imports and excises, to pay the debts and provide for the common defense and general welfare, to borrow money on the credit of the United States, to regulate commerce with foreign nations and among the several states and with the Indian tribes, to coin money and provide for certain substitutes for coin, and make provisions for controlling the value and purity of both, to fix standards of weights and measures, to establish uniform rules of naturalization, and uniform laws of bankruptcy, to establish and maintain a postal system with all needed equipment for efficient service, to make provision for the encouragement of inventors and authors by patent and copyright laws, to define and punish piracies and felonies committed on the high seas and offenses against the law of nations, to declare war and make full provision for carrying on war by land and sea by regular army and navy or by militia, and to exercise exclusive jurisdiction over all districts that are acquired for the use of the federal government in its civil or military capacities. Besides these special powers, the right to make all regulations necessary to carry these into effect is granted and by decisions of the Supreme Court has been fully established.

Scarcely less important than the powers granted to Congress are the restrictions placed upon the government. It shall not suspend the writ of *habeas corpus* except in cases of rebellion or invasion if the public safety requires it; shall not pass bills of attainder or *ex post facto* laws. No money shall be drawn from the treasury but in consequence of appropriations made by law, and regular accounts thereof shall be published; no titles of nobility shall be granted by the United States, and presents and titles from foreign governments or rulers are forbidden to office holders without the consent of the Congress.

These prohibitions are all in the interest of the people as against possible encroachments by the government.

To give needed unity of action in matters of national import the several states are forbidden to enter into any relations with foreign states and are restricted closely in their actions regarding money, the law of



contracts, and some other important matters. Especially rigid are the provisions forbidding state interference with interstate or international commerce and relations with foreign powers.

Sessions of Congress begin the first Monday in December. In the years following a congressional election the term ends on March 3d; in other years it extends until it decides to adjourn, usually early in the summer. The President may call special sessions.

Bills are introduced by private members, referred to committees, appointed by the speaker of the House and elected in the Senate, that consider and amend at will and report with such recommendations as they see fit. The committees often suppress bills, and their report has great weight in determining the action of Congress.

**The Senate.**—(a) Consists of two members from each state chosen by the state legislatures, each senator to have one vote, which he is to cast independently.

(b) The term is six years, the senators being divided into three classes so that one-third retire every two years, securing thus a continuing body. In case of a vacancy the place may be filled by appointment of the executive of the state until the state legislature meets, when it elects a senator.

(c) A senator must be thirty years of age, have been nine years a citizen of the United States and an inhabitant of the state from which he is chosen.

(d) Senators receive a salary of \$7,500 a year, mileage of 20 cents a mile each way from their homes to attend sessions, stationery, \$1,600 a year for clerk hire, and certain uses of rooms and secretaries of committees.

(e) The Senate, over whom the Vice President is the regular presiding officer, chooses a president *pro tempore* to act in the absence of the Vice President, acts as a court for the trial of impeachment cases, a two-thirds vote of the members present being required for conviction. When the President of the United States is impeached the chief justice of the United States presides.

(f) The Senate must approve the appointment of the higher officials made by the President and must approve by a two-thirds vote treaties negotiated by him with foreign powers if they are to go into effect.

**The House of Representatives.**—(a) Consists of 391 members chosen by the voters of districts in the several states made up as nearly as practicable in proportion to the number of inhabitants.

(b) For a period of two years.

(c) A representative must be 25 years of age, have been seven years a citizen of the United States, and a resident of the state from which he is chosen. By custom the representative is usually a resident of his district, but this is not necessary; and sometimes, especially in the large cities, a representative resides beyond the boundaries of his district.

(d) The salary, mileage and emoluments of representatives are the same as those of senators except that senators from their smaller numbers have a more liberal use of rooms; the allowance for secretary is only \$1,500 to a representative.

(e) The House of Representatives elects its speaker, judges the elections and qualifications of its members, makes its own rules of procedure, and has the sole right of impeachment of executive and judicial officials before the Senate sitting as a court of impeachment. Bills for raising revenue

must originate in the House of Representatives; but, as the Senate has an unlimited right of amendment, the privilege is of little value.

Both representatives and senators are frequently consulted by the President and other executive officers in making appointments to office. Moreover, committees of either house if duly authorized, may, during times when Congress is not in session, make investigations at home or abroad in connection with legislative measures. In such cases, while expenses are paid, no additional salary is given to members.

#### SPEAKERS OF THE HOUSE OF REPRESENTATIVES

CONGRESS	YEARS	NAME	STATE	BORN	DIED
1	1789-91	F. A. Muhlenberg	Pa.	1750	1801
2	1791-93	J. Trumbull	Conn.	1740	1809
3	1793-95	F. A. Muhlenberg	Pa.	1750	1801
4	1795-97	J. C. Calhoun	S. C.	1768	1825
6	1799-1801	Thos. Sedgwick	Mass.	1740	1813
7-9	1801-07	Nathaniel Macon	N. C.	1757	1837
10-12	1807-13	B. Varnum	Mass.	1760	1821
13	1811-14	Henry Clay	Ky.	1777	1852
14	1814-15	Langdon Cheves	S. C.	1737	1837
15	1815-16	Henry Clay	Ky.	1777	1852
16	1816-21	John W. Taylor	N. Y.	1784	1854
17	1821-23	P. P. Barbour	Va.	1783	1841
18	1823-25	Henry Clay	Ky.	1777	1852
19	1825-27	John W. Taylor	N. Y.	1784	1854
20-23	1827-34	A. Stevenson	Va.	1784	1857
24	1834-35	John H. Hunter	Mass.	1809	1899
24-25	1835-39	James K. Polk	Tenn.	1795	1849
26	1839-41	R. M. T. Hunter	Va.	1809	1887
27	1841-43	John White	Pa.	1808	1845
28	1843-45	John W. Jones	Va.	1805	1848
29	1845-47	John W. Davis	Ind.	1799	1850
30	1847-49	R. C. Winthrop	Mass.	1809	1894
31	1849-51	Howell Cobb	Ga.	1815	1868
32-33	1851-55	Linn Boyd	Ky.	1800	1859
34	1855-57	P. P. Barbour	Va.	1783	1841
35	1857-59	James L. Orr	S. C.	1822	1874
36	1859-61	Wm. Pennington	N. J.	1796	1862
37	1861-63	Calvin A. Gros	Pa.	1816	1907
38-40	1863-69	Samuel C. Cox	Ind.	1823	1885
41-43	1869-75	James C. Blaine	Me.	1830	1883
44	1875-77	Michael C. Kerr	Pa.	1827	1896
44-46	1876-81	J. B. Randall	Pa.	1828	1890
47	1881-83	Joseph W. Keifer	Ohio	1836	—
48-50	1883-89	John G. Carlisle	Pa.	1826	1905
51	1889-91	Thomas B. Reed	Me.	1839	1902
52-58	1891-95	Charles F. Crisp	Ga.	1845	1906
59-62	1895-99	Thomas B. Reed	Me.	1839	1902
63-67	1899-1903	J. B. Henderson	Pa.	1840	1906
68	1903-1911	J. O. Cannon	Ill.	1838	—
69	1911-12	Champ Clark	Mo.	1850	—

**II. The Executive.**—The chief executive is the president (a) chosen for a period of four years (b) by an electoral college elected by the voters of the several states usually on a general ticket, so that all electors from a state are generally from the same political party; the electors are in some states chosen by congressional districts. (c) The President must be 35 years of age and a natural-born citizen of the United States. (d) His salary is \$75,000 a year. In addition Congress has for some years voted \$25,000 for traveling expenses. He is given also secretaries, his residence, the White House, which is furnished at public expense, stables, vehicles, and other minor emoluments necessary for his position and work. (e) The President is commander-in-chief of the army and navy and of the militia when in actual military service of the United States; he grants reprieves and pardons; he makes treaties with the concurrence of two-thirds of the Senate; he nominates and by and with the advice and consent of the Senate appoints ambassadors and other foreign representatives, judges of the federal courts, and other high officials, some others being appointed by him alone or by heads of departments; he makes reports and recommendations to the Congress concerning the state of the nation and legislative action; he calls special sessions of Congress, receives ambassadors

and public ministers of foreign powers; and takes care that the laws are faithfully executed. The President approves bills passed by the Congress, or, in event of disapproval, returns them to the branch in which they originated. In case of such veto they must be repassed by a two-thirds vote of both houses to become effective. If he does not disapprove them within ten days (Sundays excepted) they become laws unless by adjournment in the meantime the Congress prevents their return, in which case they fail.

**The Vice President** has [the same qualifications and is chosen for the same term and in like manner as the President. Unless the President dies or is removed or incapacitated, his sole duty is to preside over the Senate. In case of the vacation of the President's office, he succeeds. If the Vice President dies, the members of the cabinet succeed in the order of the establishment of the departments, beginning with the Secretaries of State and the Treasury.

**The Cabinet** consists of the Secretaries of State, Treasury, War, Attorney-General, Postmaster-General, Secretary of the Navy, Secretary of the Interior, Secretary of Agriculture, Secretary of Commerce and Labor. They are (a) appointed by the President, confirmed by the Senate and (b) serve really at the pleasure of the President, usually for his term unless their resignation is sooner brought about. (c) Their salary is \$12,000 a year, and while their office expenses are covered, their personal emoluments are only incidental to the official work. (d) The members of the cabinet are the official advisers of the President in both administration work and political policy. In administrative matters each member exercises much discretion in the management of his department and usually really controls the selection of his subordinates who are not under civil service regulations. In matters of policy and making important decisions, his personal judgment is of prime importance. Routine business is frequently managed by subordinates whose tenure of office is practically during good behavior and efficiency.

**The Civil Service** is made up of (a) those officials appointed without competitive examination—generally higher officers, those whose services are personal or confidential in their nature, like private secretaries, unskilled laborers, or temporary employes, as employees of special commissions; and (b) the classified service, the members of which are appointed after a competitive examination. Such appointees are apportioned among the states in proportion to population so far as possible, and the positions are permanent during efficiency. The President may extend by order the classified service, which now includes some 200,000. Examinations are held regularly twice a year at various places throughout the country, as designated by the civil service commission, a board of three members appointed by the President to administer this law, free from the influence of partisan politics.

**III. The Judiciary** consists of the Supreme Court of the United States and such inferior courts as Congress may establish. All United States judges are appointed by the President, to hold their office during good behavior. Their salaries shall not be reduced during their term of office.

1. The Supreme Court consists of the chief justice, whose salary is \$13,000, and of eight associate justices with a salary of \$12,000 each.

## JUSTICES OF THE U. S. SUPREME COURT

NAME	SERVICE	TERM	BORN	DIED
John Jay, N. Y.	1789-1795	6	1745	1829
John Rutledge, S. C.	1789-1791	2	1739	1800
William Cushing, Mass.	1789-1810	21	1733	1810
William Wilson, Pa.	1789-1791	2	1741	1799
John Blair, Va.	1789-1790	1	1731	1800
Robert H. Harrison, Md.	1790-1790	1	1745	1790
James Iredell, N. C.	1790-1799	9	1749	1799
Thomas Johnson, Md.	1791-1793	2	1732	1819
William Paterson, N. J.	1793-1806	13	1745	1806
John Rutledge, S. C.	1795-1795	0	1739	1800
Samuel Chase, Md.	1796-1811	15	1741	1811
Oliver Ellsworth, Conn.	1796-1800	4	1740	1807
Bushrod Washington, Va.	1796-1809	13	1740	1809
Alfred Moore, N. C.	1799-1804	5	1755	1810
John Marshall, Va.	1801-1835	34	1755	1835
William Johnson, S. C.	1804-1834	30	1771	1834
Brook Livingston, N. Y.	1806-1823	17	1757	1823
Thomas Todd, Ky.	1807-1826	19	1765	1826
Joseph Story, Mass.	1811-1845	34	1779	1845
Gabriel Duvall, Md.	1811-1836	25	1752	1844
Smith Thompson, N. Y.	1823-1843	20	1767	1843
Robert Trimbur, N. Y.	1823-1843	20	1766	1843
John McLean, Ohio	1829-1861	32	1785	1861
Henry Baldwin, Pa.	1830-1844	14	1779	1844
James M. Wayne, Ga.	1835-1861	26	1790	1867
Roger B. Taney, Md.	1836-1864	28	1777	1864
Philip P. Barbour, Va.	1836-1841	5	1783	1841
John Catron, Tenn.	1837-1851	14	1786	1865
John McKinley, Ala.	1837-1852	15	1782	1852
Peter V. Daniel, Va.	1841-1860	19	1785	1860
Samuel Nelson, N. Y.	1845-1872	27	1782	1873
Levi Woodbury, N. H.	1845-1851	6	1768	1851
Robert C. Grier, Pa.	1846-1870	24	1784	1870
Benj. R. Curtis, Mass.	1841-1857	6	1809	1874
John A. Campbell, Ala.	1853-1861	8	1811	1859
Nathan Clifford, Me.	1858-1881	23	1803	1881
Noah H. Swayne, Ohio	1861-1880	19	1804	1880
Ramuel F. Miller, Iowa	1862-1890	28	1816	1890
David Davis, Ill.	1862-1875	13	1815	1886
Stephen J. Field, Cal.	1863-1896	34	1816	1896
Salmon P. Chase, Ohio	1864-1873	9	1808	1873
William Strong, Pa.	1870-1870	0	1808	1895
Joseph P. Bradley, N. J.	1870-1882	12	1813	1882
Wood Hunt, N. Y.	1872-1882	10	1811	1886
Morrison B. Waite, Ohio	1874-1888	14	1816	1888
John M. Harlan, Ky.	1882-1895	13	1833	1895
William B. Woods, Ga.	1880-1887	7	1824	1887
Stanley Matthews, Ohio	1881-1898	17	1824	1889
Horace Gray, Mass.	1881-1901	20	1830	1902
Samuel Blatchford, N. Y.	1882-1893	11	1820	1893
Lucius Q. Lamar, Miss.	1888-1893	5	1825	1893
Melville W. Fuller, Ill.	1888-1910	22	1833	1910
David J. Brewer, Kan.	1889-1910	21	1837	1910
Henry B. Brown, Mich.	1890-1906	16	1836	1906
George Shiras Jr., Pa.	1890-1903	13	1832	1903
Howell E. Jackson, Tenn.	1893-1905	12	1832	1905
Edward D. White, La.	1894-1910	16	1845	1910
William W. Taft, Ohio	1896-1910	14	1857	1909
Oliver McKenna, Cal.	1898-1902	4	1843	1902
Joseph McKenna, Cal.	1902-1902	0	1841	1902
William E. Day, Ohio	1903-1906	4	1848	1906
William H. Moody, Mass.	1906-1910	4	1853	1910
Horace H. Lurton, Tenn.	1906-1910	4	1844	1910
Charles E. Hughes, N. Y.	1910-1910	0	1862	1910
Willie Van Devanter, Wyo.	1910-1910	0	1859	1910
Joseph R. Lamar, Ga.	1910-1910	0	1857	1910

2. Nine circuit courts of appeal have been established which consist of three judges each. Eligible to sit in this court are the Supreme Court justice assigned to the circuit, the circuit judges (of which there are two to four in each circuit), and the district judges within the circuit. The salaries are \$7,000.

3. The territory of the United States has been divided into some 901 judicial districts, none of them crossing state lines. There is usually one in each district, though at times a judge is assigned to two districts. The salaries are \$6,000.

A judge who is 70 years of age and has served ten years may retire on full pay for life.

4. The United States courts have (also appointed by the President) district attorneys and marshals to prepare and prosecute cases in behalf of the government and to execute processes and other orders of the courts.

5. The jurisdiction of the federal courts pertains to matters concerning the federal government, such as the post-office, coinage laws, etc., and to cases which might involve the states in disputes with one another or with foreign countries.

6. Besides the courts mentioned for the disposal of controversies, there has been established (a) the court of claims, before which come claims of various kinds (excepting pensions) against the United States, and (b) the customs court, which settles controversies arising in connection with the collection of our customs duties.

**The States.** 1. The original thirteen states, at the suggestion of the Continental Congress, each in its own way and time adopted a state constitution. It is customary of late years for the Congress to pass an act admitting a state under prescribed conditions of boundaries, population, etc., with the provision that it shall frame and adopt a constitution satisfactory to the Congress. These are all modeled in part after the constitution of the United States and of the older states. Of late years there is a tendency to make them longer and to include in the constitution subjects usually left to the legislature.

2. (a) All the states have legislatures consisting of two houses. The members of the larger, or lower, house are elected from districts and meet in six states annually; in the others the legislature meets only biennially. Members of the upper house are usually chosen for a period of two or more years. (b) Salaries are paid to all but day from annual salaries to a per diem for days actually served. In several states the sessions are limited in time to sixty or ninety days. (c) In most of the states there are restrictions upon the powers of the legislature, such as prohibitions of special legislation, and limiting the borrowing power of cities. Provisions against corrupt lobbying, blackmail and other abuses are common. In the main, the laws that touch most closely our daily life, those regarding contracts, crimes, marriage and divorce, inheritance, etc., are left to the states. Of

late there is a movement in some of the states toward direct legislation by the people under the initiative and referendum.

3. The executive department of the state consists of a governor, lieutenant-governor, secretary of state, auditor or controller, treasurer, attorney-general and others needed to carry out the laws. The terms and compensation vary in the different states. The most important difference between the state and federal executive departments is that in the states the other officers are elected and not appointed by the governor, so that there is not the unity of action that comes from an appointive cabinet.

4. The judiciary department consists of a supreme court, and sometimes a court of appeals, and of such subordinate courts as the size of the state and the nature of its business and customs have made suitable. There are great similarities throughout the country. The judges are usually elected and for terms of two to fourteen years.

5. The county, town and city governments are all under the control of the state, but the forms vary widely, usually there being a tendency, as regards the rural districts especially, to follow models of some of the older states as indicated in the brief historical introduction. Each local subdivision has, of course, some body with minor legislative or ordinance powers, an executive and a judiciary.

**Territories and Dependencies.**—The territories and the insular dependencies of Hawaii, Porto Rico and the Philippine islands are under governments established by Congress and approved by the President and subject to change by regular legislative procedure.

All have governors and administrative and judicial officers appointed by the President. To them Congress has given a legislative body to make new laws under the powers granted. In Porto Rico and the Philippine islands the members of the upper house are appointed by the President and consist in part of the administrative officers mentioned. The lower house is elective. In event of a deadlock the revenue and appropriation laws of the preceding year continue in force. No new laws can be made without the assent of both houses. There seems to be an inclination to increase the powers of self-government of the territories and insular possessions as rapidly as the people, hitherto not accustomed to self-rule, shall show themselves fit to take it.

In all cases Congress retains under the constitution the right to modify to any extent the method of governing these territories and possessions.

## PRESIDENTIAL ELECTIONS AND INAUGURATIONS

YEAR	PRESIDENTIAL CANDIDATES	STATE	PARTY	VOTE			NAME	STATE	FACTS CONCERNING THE INAUGURATION OF THE PRESIDENTS	AGE of President at Inauguration
				Total	Electoral	Popular				
1789*	George Washington	Va.	.....	73	09	.....	John Adams	Mass.	1. George Washington was inaugurated President of the United States on a portico in front of the Senate chamber, Thursday, April 30, 1789, in the Federal building, 55 Broadway Street, in New York. The oath of office was administered by Robt. R. Livingston, chancellor of the state of New York, who exclaimed when the oath was taken, "Long live George Washington, President of the United States."	57
	John Adams	Mass.	.....	34	.....	.....				
	John Jay	N. Y.	.....	9	.....	.....				
	B. H. Harrison	R. C.	.....	6	.....	.....				
	John Rutledge	Mass.	.....	4	.....	.....				
	John Hancock	Mass.	.....	2	.....	.....				
	George Clinton	N. Y.	.....	2	.....	.....				
	Samuel Huntington	Conn.	.....	1	.....	.....				
	John Milton	Ga.	.....	1	.....	.....				
	James Armstrong	Mass.	.....	1	.....	.....				
	Benjamin Lincoln	Mass.	.....	1	.....	.....				
	Edward Telfair	Ga.	.....	1	.....	.....				
	Vacancies		.....	1	.....	.....				

\*Prior to 1804 each elector was entitled to vote for two candidates for President. The candidate receiving the greatest number of votes was declared elected, while the candidate receiving the next highest vote was declared Vice-President. [Electoral votes not cast.]

## PRESIDENTIAL ELECTIONS AND INAUGURATIONS—Continued

Year	Presidential Candidates	State	Party	Vote			Candidates for Vice-President		Facts concerning inauguration of the President	Age of President at inauguration
				Total Vote	Electoral Vote	Popular Vote	Name	State		
1792	George Washington John Adams George Clinton Thomas Jefferson Aaron Burr (Vacancies)	Va. Mass. N. Y. Va. N. Y.	Fed. Fed. Rep. Fed. Fed.	135 132 77 50 1 8	132 77 50 1 8	..... ..... ..... ..... ..... .....	John Adams	Mass.	II. George Washington, for a second term, in the Senate chamber, Monday, March 4, 1793, in the Old Federal hall, Philadelphia. Oath of office administered by William Cushing of Massachusetts, associate justice of the Supreme Court of the United States.	—
1796	John Adams Thomas Jefferson Thomas Pinckney Aaron Burr Samuel Adams Oliver Ellsworth George Clinton John Jay James Iredell George Washington John Henry S. Johnson C. C. Pinckney	Mass. Va. S. C. Mass. Mass. Conn. N. Y. N. Y. N. C. Va. Md. N. C. S. C.	Fed. Rep. Fed. Rep. Rep. Ind. Rep. Fed. Fed. Fed. Fed. Fed. Fed.	138 71 68 59 39 15 11 7 5 5 5 2 2	132 68 59 39 15 11 7 5 5 5 2 2	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	Thomas Jefferson	Va.	III. John Adams, in the chamber of the House of Representatives, Congress hall, Saturday, March 4, 1797, in Philadelphia. Oath of office administered by Oliver Ellsworth, chief justice of the United States.	61
1800	Thomas Jefferson Aaron Burr John Adams C. C. Pinckney John Jay	Va. N. Y. Mass. S. C. N. Y.	Fed. Rep. Fed. Fed. Fed.	138 73 73 64 1	73 73 64 1	73 73 64 1	Aaron Burr	N. Y.	IV. Thomas Jefferson, in the Senate chamber of the Capitol, Wednesday, March 4, 1801, in the city of Washington. Oath of office administered by John Marshall, chief justice of the United States.	57
1804	Thomas Jefferson C. C. Pinckney	Va. S. C.	Fed. Fed.	176 12	162 14	..... .....	George Clinton Rufus King	N. Y. N. Y.	V. Thomas Jefferson, for a second term, in the Senate chamber, Washington, Monday, March 4, 1805, by Chief Justice John Marshall.	58
1808	James Madison C. C. Pinckney George Clinton	Va. S. C. N. Y.	Fed. Fed. Rep.	176 47 6	122 4 .....	..... ..... .....	George Clinton Rufus King John Langdon James Madison James Monroe Elbridge Gerry Jared Ingersoll	N. Y. N. Y. N. H. N. H. Va. Mass. Pa.	VI. James Madison, in the chamber of the House of Representatives, Washington, Saturday, March 4, 1809. Oath of office administered by Chief Justice John Marshall.	58
1812	(Vacancy) James Madison De Witt Clinton	..... Va. N. Y.	..... Rep. Fed.	..... 218 89	..... 128 89	..... ..... .....	(Vacancies)	.....	VII. James Madison, for a second term, Thursday, March 4, 1813. From the <i>National Intelligencer</i> of March 6th, it appears to have taken place in the Representatives hall, and the oath was administered by Chief Justice Marshall.	59
1816	James Monroe Rufus King (Vacancies)	Va. N. Y.	Rep. Fed.	221 183 4	183 34 4	..... ..... .....	D. D. Tompkins John E. Howard James Ross John Marshall	N. Y. Md. Va. Va.	VIII. James Monroe, Tuesday, March 4, 1817. Oath administered by Chief Justice John Marshall, on a platform erected for the purpose, in front of the eastern portico of the Capitol at Washington.	59
1820	James Monroe John Q. Adams	Va. Mass.	Rep. Rep.	235 231	231 1	..... .....	Robert G. Harper D. D. Tompkins Richard Stockton Daniel Rodney Robert G. Harper Richard Rush	Md. N. Y. N. J. Del. Md. Pa.	IX. James Monroe, for a second term, in the House of Representatives, Monday, March 5, 1821. Here the 4th of March came on Sunday, and he took the oath of office in the hall of the House of Representatives at 12 o'clock on Monday next, March 5, 1821. Oath administered by Chief Justice Marshall.	58
1824	John Q. Adams Andrew Jackson Henry Clay W. H. Crawford	Mass. Tenn. Ky. Ga.	Rep. Dem. Rep. Rep.	361 284 37 40	841 152,544 47,136 46,618	108,740 152,544 47,136 46,618	John C. Calhoun Nathan Sanford Nathaniel Macon Andrew Jackson Martin Van Buren Henry Clay	S. C. N. Y. N. C. Tenn. N. Y. Ky.	X. John Quincy Adams, in the hall of the House of Representatives, Friday, March 4, 1825. Oath of office administered by Chief Justice Marshall.	58
1828	Andrew Jackson John Q. Adams	Tenn. Mass.	Dem. Nat. Rep.	361 85	178 85	647,286 508,064	John C. Calhoun Richard Rush William Smith	S. C. N. Y. S. C.	XI. Andrew Jackson, on the eastern portico of the Capitol, Wednesday, March 4, 1829. Oath administered by Chief Justice Marshall.	63
1832	Andrew Jackson Henry Clay John Floyd William Wirt (Vacancies)	Tenn. Ky. Ga. Md.	Dem. Nat. Rep. Fed. Anti-M.	288 219 49 11 7	219 687,502 630,169 11 7	..... ..... ..... ..... .....	Martin Van Buren John Sergeant Henry Lee Amos Ellmaker William Wilkins	N. Y. Pa. Pa. Mass. Pa.	XII. Andrew Jackson, for a second term, in the hall of the House of Representatives, Monday, March 4, 1833. Oath administered by Chief Justice Marshall.	63
1836	Martin Van Buren Wm. H. Harrison Hugh L. White Daniel Webster W. F. Massey	N. Y. Ohio Tenn. Mass. N. C.	Dem. Whig Whig Whig Whig	294 170 73 26 14 11	170 73 26 14 11	762,678 735,051 ..... ..... ..... .....	R. M. Johnson Francis Granger John Tyler William Smith	Ky. N. Y. Va. Ala.	XIII. Martin Van Buren, on the eastern portico of the Capitol, Saturday, March 4, 1837. Oath administered by Chief Justice Taney.	55
1840	Wm. H. Harrison Martin Van Buren James G. Birney	Ohio N. Y. N. Y.	Whig Dem. Lib.	294 60 .....	234 1,129,122 7,069	1,275,016 1,129,122 7,069	John Tyler R. M. Johnson L. W. Tazewell James K. Polk Thomas Earle	Va. N. Y. W. Va. Tenn. Pa.	XIV. William Henry Harrison, on the eastern portico of the Capitol, Saturday, March 4, 1841. Oath administered by Chief Justice Taney.	68
1844	James K. Folk Henry Clay James G. Birney	Tenn. N. Y. N. Y.	Dem. Whig Lib.	275 107 103	170 1,237,243 1,239,062	1,237,243 1,239,062 62,300	George M. Dallas T. F. Frylinghusen Thomas Morris	N. J. Pa. Ohio	XV. James Knox Polk, on the eastern portico of the Capitol, Tuesday, March 4, 1845. Oath administered by Chief Justice Taney.	50
1848	Zachary Taylor Lewis Cass Mario Van Buren	La. Mich. N. Y.	Whig Dem. F. S.	290 127 .....	163 1,230,544 291,263	1,360,099 1,230,544 291,263	Millard Fillmore Wm. O. Butler Chas. F. Adams	N. Y. Ky. Mass.	XVI. Zachary Taylor, on the eastern portico of the Capitol, Monday, March 5, 1849. Here for the second time March 4th came on Sunday. Oath administered by Chief Justice Taney.	65
									XVII. Millard Fillmore, in the hall of the House of Representatives, 12 noon, Wednesday, July 10, 1850. Oath administered by Judge William Cress.	51



**PARLIAMENTARY LAW** and practice consist of those rules, precedents, and usages which are generally accepted as the most convenient and practicable for the government of proceedings in deliberative assemblies or organizations. Most of the essential rules now accepted had their origin in the English parliament, although some of them have been changed to adapt them to the needs of our legislative bodies. The rules and usages of Congress have the greatest weight as correct parliamentary law in the United States generally, but the legislature of each state has a code of its own containing the general rules, and special ones not commonly accepted.

Besides the common parliamentary law, which is recognized by deliberative bodies in general, each body may make rules for its own government. When there are no special rules to the contrary the body is controlled by the principles of common parliamentary practice, and these principles govern if there are no rules enacted by the body itself.

**Uses.**—Parliamentary law is used in deliberative bodies in order that there may be a mutual understanding as to what may be done; that the rights of the body and of its individual members may be protected, and that business may be transacted with expedition and also deliberation.

A gathering does not become a deliberative body until it is duly organized. This implies officers and members. The number of the former may vary according to circumstances. There must be one to preside over the deliberations. Then there should be a clerk or secretary to keep a record of the transactions.

Parliamentary practice presumes that, ordinarily, matters for discussion and decision emanate from some member or members of the meeting, and that the discussing and deciding is done by the membership.

**Organization.—Temporary.**—At the time appointed, or a few moments later, some one steps forward and requests the meeting to come to order, and, having secured attention, he either makes a motion that a certain person, giving his name, act as chairman, or asks the assembly to nominate a chairman. And he puts motions or nominations to vote, until some one is elected to preside. The chairman then takes his place, and the organization is completed by the nomination and election of a secretary, and any other necessary officers.

**A Convention of Delegates.**—In the case of a convention of delegates, a temporary organization is first made by electing a chairman and secretary *pro tem.* Then, if the chairman is chosen, to ascertain who are duly authorized to take part in the deliberations and the voting. The committee on credentials is the body of persons who are found to have proper credentials; also doubtful or contested cases, with recommendations. No one without credentials is admitted to vote on the report of the committee, or on any question until he is duly accepted as a delegate. The organization is then completed by the nomination and election of permanent officers.

After a meeting is duly organized, it is customary for some member to state briefly the object of the meeting, and business may be introduced at once, or the time may be occupied by addressing the committee is sometimes appointed to prepare resolutions, while addresses are being given to fill up the time, and they repeat the same or they may be given more time, and bring in their resolutions after a recess, or at a subsequent meeting.

**Permanent.**—In organizing a permanent society a temporary organization is first effected, after which the chairman is elected upon some person who is taking a leading part in getting up the society to state the object of the proposed organization for resolution or resolution of the organization is next in order, and, if carrying out the committee is appointed to draft a constitution or by-laws or rules. The constitution should be in the form of articles at least, viz.: 1. Name and object of the society. 2. Qualifications of members. 3. Officers, their election and duties. 4. Powers of the society. 5. How to amend the constitution.

At the second meeting the constitution is adopted and after all have signed the constitution who wish to become members, by-laws are adopted if desired, and a committee is appointed to prepare permanent officers to be elected at this or an adjourned meeting. Each officer as elected takes the place of the temporary one, and when all are elected the organization is completed.

**Nominations and Elections.**—Generally the most prudent and expeditious way of making nominations is to place the matter in the hands of a committee created for the purpose, who, after due consideration, make the nominations and tender them to the assembly after which a vote is taken and seconded to adopt the report of the committee. Then the names of the nominees are read, and each member is given an opportunity for amendments. Any member who is not satisfied with a nomination may move to substitute another name, and if this motion receives a second and is carried the substituted name takes the place of the regular nominee.

The vote, if by acclamation, may be taken upon each name before passing to the next, but the more common way is to vote upon the names as a whole, and the entire list has to be elected at once.

Sometimes the chairman is authorized by the assembly to make the nominations, and in this case the names are treated the same as if brought in by a committee. Another way of nominating is as follows: Some member rises and says, "I nominate Mr. A. for the office of chairman, Mr. B. for the office of secretary, and Mr. C. for the office of treasurer." If the motion is seconded, the names are read, and a vote is taken. If the motion is not seconded, some member moves that the nominations close, and if this motion is seconded and carried, the chairman then reads the names, in the order in which the nominations were made, and continues until one is elected. If the chairman then one office has been filled, the same process must be gone through with in each individual case.

If the election is to be by ballot, and the names are on the ballots, each voter may cast his ballot as it is, or he may cross off names and write others as he wishes. If blank slips are used, each voter writes on his slip the names of the nominees, or substitutes other names according to his choice. A motion for all the votes cast is necessary to choose. In case the office or offices are not filled at the first ballot, the voting must be continued until the necessary officers are elected.

**Officers and Their Duties.**—**Chairman, President, or Moderator.**—The presiding officer is generally known by one of these titles. He should be addressed by his title, and in referring to himself he should always use his official title, thus: "I am the chairman of this assembly," etc.

It is his duty to take the chair and call the meeting to order at the proper time, to announce in its name the names of those who are to be proposed, to put them to vote, and to declare the result of the vote; to see that the rules of debate are followed; to order the assembly to come to order or course of proceeding, by request, or when he finds it necessary to do so; to receive all persons and other communications and announce them to the assembly, to act for the assembly in signing all papers, etc.

He may sit while stating a question, but he should rise to put a question to vote, or to speak to a question of order.

**Vice-President.**—The vice-president acts in place of the president in his absence.

**Clerk or Secretary.**—The recording officer, whether called clerk or secretary, keeps a correct record of all proceedings, and he reads the minutes made at the next meeting. In the absence of the chairman (if there is no vice-president present), it is his duty to call the meeting to order, to take the chair while the assembly proceeds to elect a chairman *pro tem.*, to read papers to be acted upon, to receive and to read questions to be referred to the assembly when necessary, to hand to the chairman of every committee appointed a list of the names of the members of the committee, and the matter committed to them; to make out in order, and hand to the chairman before each meeting, a list of the names of the members of the committee, of all papers and documents, to sign his name to the minutes, and to authenticate by his signature alone, or in connection with that of the chairman, the orders, and the proceedings of the assembly. In some assemblies the secretary also acts as treasurer.

**Treasurer.**—The treasurer has charge of the funds of the assembly and pays out the money as it is assembled signed by the secretary. His annual report should give the amount in the treasury at the beginning of the year, the amount received, the amount paid out, and the balance on hand. This report should be examined by an auditor or an auditing committee, and the accounts by the itemized accounts kept by the treasurer, and the receipts he has received for payments made; and if found correct it should be approved by a vote of the assembly.

**Committees.**—A committee for deliberation or investigation should be large, and should represent all classes and localities. A committee for action

should be small, and should consist of those only who are to carry out the proposed action.

A committee may be nominated and elected, or the chairman may be authorized by the constitution or by-laws to appoint the committee. The constitution or by-laws may also prescribe the number of members, and in some cases each shall be composed, or the number may be included in the motion if the appointment is ordered by the assembly.

Sometimes the assembly proposes different numbers, and in this case the number is decided by vote, or by-laws may be proposed, and then upon the next, and so on until a vote is carried deciding the number. A standing committee is one appointed for a particular occasion. A standing committee is one appointed beforehand, for all matters that may arise of the same nature.

The person first named on a committee calls the members together, and presides all through, or until the committee elects another chairman; which is seldom done. In the absence of the first member, the next in order who is present acts as chairman. The committee chooses one of its own number to act as secretary. It conducts its proceedings in the same manner as business is conducted in the assembly.

A committee must be allowed to do business, and a quorum must be present.

Any paper or amendment must not be altered, or rejected by them. The committee may present amendments written on another sheet, or they may recommend amendments to be adopted if any recommendation they see fit. The report of the committee is signed by all the members, or by the chairman alone, and makes the report to the assembly unless another has been chosen to tender it. Only that which has been agreed upon by the majority can be incorporated in the report, but the minority may also tender a report if they choose. The majority report may be substituted for the report, or the committee may vote of the assembly. When the committee has tendered its report in full and the report has been accepted, the committee is thereby discharged, but it may be revived by having the report of some part of it referred back to it.

Committee members are free from time to time until their work is completed, then the motion is to rise, which motion means the same as to adjourn, and is so acted upon.

**Committee of the Whole.**—The object of resolving the assembly into the "committee of the whole," is to do away with the distinction between the committee and the assembly, and to make the report of a subject that is allowed under ordinary circumstances, and the motion is, "That the assembly do now consider the report of the committee of the whole," etc., specifying the subject. If carried, the presiding officer at once calls another member to the chair, and the assembly becomes a committee of the whole. The only motions in order are "to amend," "to adopt," and "to rise and adjourn." The committee of the whole, the assembly may pass an order limiting debate, which order cannot be changed in the committee.

The chairman having resumed his seat, the member who presided in the committee rises and informs the chairman that he is ready to report. The report may then be received, or the time fixed when it shall be received.

The clerk keeps the minutes of the proceedings of the committee, if there is not an assistant clerk to keep them, but the only record he makes in the minutes of the assembly is the report as received from the committee. If at any time the committee becomes disorderly, the presiding officer may remove the disorderly member, or the committee be dissolved.

The quorum of the committee of the whole is the same as that of the assembly.

**Informal Action.**—Instead of going into a committee of the whole, the assembly may consider a question informally, with the chairman presiding, and the same restrictions apply as in the committee of the whole. In this case the chairman retains his seat, and there is no motion to rise and report. The chairman reads the subject that has been considered before the assembly, and it is treated of as if it were a formal action.

Any motion except "to amend" or "to adopt" puts an end to the informal action. A temporary memorandum of the same nature as the minutes of the whole, and the clerk enters the chairman's report only in the minutes.

**Quorum.**—A quorum of an assembly, or of a committee, is the number of members as it is composed to transact business; and unless the number is prescribed by the constitution or by-laws, or by an order of the assembly, it is the majority of the members. The number may be fixed at much less than a majority. When a quorum is not present, the only action that may be taken is to adjourn.

**Order of Business.**—In the absence of special rules upon any subject, the regular order of business is as follows:

1. Reading the minutes of the previous meeting. 2. Reports of standing committees, managers, trustees, etc., come under this head.

3. Reports of special committees, managers, trustees, etc., come under this head.

4. Reports of special committees, managers, trustees, etc., come under this head.

5. Reports of special committees, managers, trustees, etc., come under this head.

6. Reports of special committees, managers, trustees, etc., come under this head.



## Modifying or amending.

8. To amend or to substitute, or to divide the question.....

To refer to committee.....

7. To commit (or recommit).....

Deferring action.....

6. To postpone to a fixed time.....

4. To lay on the table.....

5. For the previous question.....

To limit, or raise, debate.....

To extend limits of debate.....

Suppressing the question.....

Objection to consideration of question.....

Appeal from chair's decision touch-  
ing indecorum.....

Appeal from chair's decision gener-  
ally.....

Question upon reading of papers.....

Withdrawal of a motion.....

Rule A.—Undebatable, but remarks may be tacitly allowed.

Rule B.—Undebatable if another question is before the assembly.

Rule C.—Limitable debate allowed on propriety of postponement only.

Rule D.—Opens the main question to debate.

Motion not so marked do not allow of reference to main question.

Rule E.—Cannot be amended. Motion to adjourn can be amended when there is no other business before the house.

Rule F.—Cannot be reconsidered.

Rule G.—An affirmative vote cannot be reconsidered.

Rule H.—In order when another has the floor.

Rule I.—A motion to reconsider may be moved and entered when another has the floor, but the business then before the house may not be set aside.

This motion can only be entertained when made by one who voted originally with the prevailing side. When called up it takes precedence of all others which may come up, excepting only motions relating to adjournment.

Rule K.—A motion to amend an amendment cannot be amended.

Rule L.—When an appeal from the chair's decision results in a tie vote, the chair is sustained.

Rule M.—Requires a two-thirds vote unless special rules have been enacted.

Rule N.—Does not require to be seconded.

General Rules.—No motion is open for discussion until it has been stated by the chair.

The maker of a motion cannot modify it or withdraw it after it has been stated by the chair, except by general consent.

Only one reconsideration of a question is permitted.

A motion to adjourn, to lay on the table, or to take from the table, cannot be renewed unless some other motion has been made in the interval.

On motion to strike out the words, "Shall the words stand or part of the motion?" unless majority sustains the words, they are struck out.

On motion for previous question, the form to be observed is, "Shall the main question now put?" This, if carried, ends debate.

On an appeal from the chair's decision, "Shall the decision be sustained as the ruling of the house?" the chair is generally sustained.

On motion for orders of the day, "If all the business now proposed be the order of the day?" This, if carried, supersedes intervening motions.

When an objection is raised to considering questions, "Shall the question be considered?" objections may be made by any member before debate has commenced, but not subsequently.

## COMMERCIAL LAW IN THE VARIOUS STATES

STATES AND TERRITORIES	INTEREST LAWS		DATE OF GRACE	STATUTES OF LIMITATION			ASSETS FOR DEBT	EXEMPTION LAWS		JURISDICTION OF JUSTICES OF THE PEACE	
	Legal Rate Per Cent	Allowed by Contract Per Cent		Penalty for Interest	Judgments Years	Notes Years		Open Accounts Years	Personal Property Exempt		Homestead Exempt
Alabama.....	8	8	Forfeit interest.....	2	20	6	3	No	\$1,000	\$2,000	\$100
Arizona.....	6	Any	No provision.....	0	5	4	3	No	500	2,500	300
Arkansas.....	6	10	Forfeit principal and interest.....	3	10	5	3	No	500	2,500	700
California.....	7	Any	No provision.....	0	5	4	2	No	500	5,000	300
Colorado.....	8	Any	No provision.....	0	10	6	6	No	500	2,000	300
Connecticut.....	6	15	Fine or imprisonment or both.....	0	7	6	6	No	1,000	1,000	100
Delaware.....	6	8	Principal and interest forfeited.....	0	10	6	3	No	200	200	200
District of Col.	6	6	Forfeit interest.....	0	12	3	3	No	300	...	300
Florida.....	8	10	Forfeit interest.....	0	20	5	3	No	1,000	160 Acres	100
Georgia.....	7	8	Forfeit excess of interest.....	0	7	5	4	No	300	1,000	100
Idaho.....	7	12	Forfeit interest and 10% of principal.....	0	6	5	4	No	...	5,000	300
Illinois.....	5	7	Forfeit interest.....	0	20	10	5	No	400	1,000	200
Indiana.....	6	8	Excess interest forfeited.....	0	20	10	8	No	600	or 600	200
Iowa.....	6	8	Forfeit interest and 8% of principal.....	0	20	10	5	No	200	or 40 Acres	100
Kansas.....	6	10	Forfeit of double amount of usurious interest.....	0	5	5	3	No	...	160 Acres	300
Kentucky.....	6	8	Forfeit of interest.....	3	15	15	5	No	250	1,000	100
Louisiana.....	5	8	Forfeit interest.....	0	10	5	3	No	...	Total, 2,000	100
Maine.....	6	Any	No provision.....	0	20	20	6	No	...	500	20
Maryland.....	6	6	Forfeit interest.....	0	12	3	3	No	100	...	100
Massachusetts.....	6	Any	No provision.....	0	20	6	8	Yes	800	1,000	1,000
Michigan.....	5	7	Forfeit interest.....	0	6 and 10	6	6	No	500	1,500	300
Minnesota.....	6	10	Forfeit principal and interest.....	0	6	6	6	No	200	80 Acres	100
Mississippi.....	6	10	Forfeit interest.....	3	7	6	3	No	200	200	200
Missouri.....	6	8	Forfeiture or misdemeanor.....	0	10	10	5	No	300	1,500 (min.)	250
Montana.....	8	Any	No provision.....	0	10	8	3	No	2,500	2,500	200
Nebraska.....	7	10	Forfeit interest.....	0	5	5	4	No	500	or 2,000	200
Nevada.....	7	Any	No provision.....	0	6	6	4	No	...	5,000	300
New Hampshire.....	6	6	Forfeit three times excess.....	0	20	6	6	No	500	800	13 1/4
New Jersey.....	6	6	Forfeit interest and costs.....	0	20	6	6	No	200	1,000	200
New Mexico.....	6	12	Forfeit of twice the amount of interest.....	3	7	6	4	No	500	1,000	100
New York.....	6	6	Forfeit of principal and interest; misdemeanor.....	0	20	6	6	No	250	1,000	200
North Carolina.....	6	6	Forfeit interest.....	0	10	3	3	No	600	1,000	200
North Dakota.....	7	12	Forfeit excess interest.....	0	10	6	6	No	1,500	5,000	200
Ohio.....	6	8	Forfeit interest over 8%.....	0	5	13	6	No	100	1,000	300
Oklahoma.....	6	10	Forfeit interest.....	0	1	5	3	No	...	5,000	200
Oregon.....	6	10	Forfeit principal and interest.....	3	10	6	6	No	100	1,500	250
Pennsylvania.....	6	8	Forfeit excess of interest.....	0	5	8	6	No	300	...	500
Rhode Island.....	6	Any	No provision.....	0	20	6	6	Yes	300	1,000	...
South Carolina.....	7	8	Forfeit interest.....	3	20	6	6	No	500	1,000	100
South Dakota.....	7	12	Misdemeanor.....	3	20	6	6	No	750	5,000	...
Tennessee.....	6	8	Forfeit of excess interest.....	0	10	6	4	No	...	1,000	500
Texas.....	6	10	Forfeit interest.....	0	10	4	2	No	500	5,000	200
Utah.....	8	12	No provision.....	0	8	6	4	No	...	2,000	300
Vermont.....	6	6	Forfeit of excess interest.....	0	8	14	8	No	200	500	300
Virginia.....	6	6	Forfeit interest.....	0	20	5	2	No	...	2,000	100
Washington.....	6	12	Forfeit of double accrued interest and costs.....	0	6	6	3	No	1,500	2,000	100
West Virginia.....	6	6	Forfeit excess interest.....	0	10	10	5	No	200	1,000	300
Wisconsin.....	6	10	Forfeit treble amount of usurious interest paid.....	0	20	8	6	No	200	5,000	200
Wyoming.....	8	12	Forfeit interest.....	3	5	5	8	Yes	500	1,500	200

NOTE.—In many of the states it is impossible to place a fixed amount on personal property exempt. In the table above these states have an amount given in the personal property column.

TABLE 1—PERSONAL FACTS RELATING TO

The black figures in date column correspond

No	ADDITIONAL FACTS	PRESIDENTS	BORN		PARENTS		PATERNAL ANCESTRY	FATHER'S BUSINESS
			Date	Birthplace	Father	Mother		
1	1-2	George Washington	Fri., Feb. 11 22, 1732	Bridges Creek, near Fredericksburg, Va.	Augustine	Mary Ball	English	Planter
2	3	John Adams	Wed., Oct. 19 30, 1735	Braintree, Mass.	John	Susanna Boylston	English	Farmer
3	4-5	Thomas Jefferson	Tues., April 2 13, 1743	Shadwell, Va.	Peter	Jane Randolph	Welsh	Planter
4	6-7	James Madison	Fri., Mar. 6 16, 1751	Port Conway, Va.	James	Nellie Conway	English	Planter
5	8-9	James Monroe	Fri., April 28, 1758	Westmoreland Co., Va.	Spence	Elizabeth Jones	Scottish	Planter
6	10	John Quincy Adams	Sat., July 11, 1767	Brancaster, Mass., now Quincy	John	Abigail Smith	Scottish	Lawyer
7	11-12	Andrew Jackson	Sun., Mar. 15, 1767	Wachaw Settlement, N. C.	Andrew	Elizabeth Hutchinson	Scottish-Irish	Farmer
8	13	Martin Van Buren	Thurs., Dec. 5, 1782	Kinderhook, N. Y.	Abraham	Mary Haas	Dutch	Farmer
9	14	William Henry Harrison	Tues., Feb. 9, 1773	Berkeley, Va.	Benjamin	Elizabeth Bassett	English	Statesman
10	14	John Tyler	Mon., Mar. 29, 1790	Charles City Co., Va.	John	Mary Armistead	English	Farmer
11	15	James Knox Polk	Mon., Nov. 2, 1795	Mecklenburg Co., N.C.	Samuel	Jane Knox	Scottish-Irish	Farmer
12	16	Zachary Taylor	Tues., Nov. 24, 1784	Orange Co., Va.	George	Sarah Brodher	English	Farmer
13	16	Millard Fillmore	Tues., Jan. 7, 1800	Summer Hill, N. Y.	Nathaniel	Phoebe Millard	English	Farmer
14	17	Franklin Pierce	Fri., Nov. 23, 1804	Hillsborough, N. H.	Benjamin	Anna Kendrick	English	Farmer
15	18	James Buchanan	Sat., April 23, 1791	Stony Batter, Pa.	James	Elizabeth Spear	Scottish-Irish	Merchant
16	19-20	Abraham Lincoln	Sun., Feb. 12, 1809	Nolin Creek, Ky.	Thomas	Nancy Hanks	English	Farmer
17	20-21	Andrew Johnson	Thurs., Dec. 29, 1808	Raleigh, N. C.	James	Mary McDonough	English	Sermon
18	21-22	Ulysses Simpson Grant	Sat., April 27, 1822	Poist Pleasant, Ohio	James Root	Harriet Simpson	Scottish	Farmer
19	23	Rutherford Birchard Hayes	Fri., Oct. 4, 1822	Dawson, Ohio	Rutherford	Scotia Birchard	Scottish	Merchant
20	24	James Abram Garfield	Sat., Nov. 19, 1831	Bedford, Ohio	Abram	Eliza Ballou	English	Farmer
21	24	Chester Alan Arthur	Tues., Oct. 5, 1830	Fairfield, Vt.	William	Melville Stone	Scottish-Irish	Clergyman
22	25	Grover Cleveland	Sat., Mar. 18, 1837	Caldwell, N. J.	Rich'd Fallay	Anne Neale	English	Clergyman
23	26	Benjamin Harrison	Tues., Aug. 20, 1833	North Bend, Ohio	John Scott	Elizabeth Findlay Irwin	English	Farmer
24	27	Grover Cleveland	Sat., Mar. 15, 1837	Caldwell, N. J.	Rich'd Fallay	Anne Neale	English	Clergyman
25	28-29	William McKinley	Sun., Jan. 29, 1843	Niles, Ohio	William	Nancy Allison	Scottish-Irish	Iron Mfr.
26	29-30	Theodore Roosevelt	Wed., Oct. 27, 1858	28 E. 20th St., New York City	Theodore	Martha Bullock	Dutch	Merchant
27	31	William Howard Taft	Tues., Sept. 15, 1857	Cincinnati, Ohio	Alphonso	Louise M. Torrey	English	Lawyer

TABLE II.—PERSONAL FACTS RELATING TO

NAME	RESIDENCE WHEN ELECTED	TERM OF OFFICE		SUBSEQUENT CAREER	DIED	CAUSE OF DEATH
		From	To			
Washington	Mt. Vernon, Va.	Apr. 30, 1789	Mar. 4, 1797	Agricultural pursuits; appointed commander-in-chief (1798) because of threatened war with France.	1799	Acute laryngitis.
Adams	Quincy, Mass.	Mar. 4, 1797	Mar. 4, 1801	Member of the Massachusetts Constitutional Conven- tion of 1820.	1826	Natural decline.
Jefferson	Monticello, Va.	Mar. 4, 1801	Mar. 4, 1809	Retired to his plantation at Monticello, Va.; devoted much time to the University of Virginia.	1826	Chronic diarrhoea.
Madison	Montpelier, Va.	Mar. 4, 1809	Mar. 4, 1817	Retired to Montpelier, Va.; contributed large service to University of Virginia; retired in the Virginia Constitutional Convention, 1829.	1836	Natural decline.
Monroe	Oakhill, Va.	Mar. 4, 1817	Mar. 4, 1825	Retired to private life in Virginia; served as a member of the Virginia Constitutional Convention in 1830.	1831	Natural decline.
J. Q. Adams	Quincy, Mass.	Mar. 4, 1825	Mar. 4, 1829	Was returned to Washington as a member of the House of Representatives; served from 1830 to his death.	1848	Paralysis.
Jackson	Hermitage, Tenn.	Mar. 4, 1829	Mar. 4, 1837	Retired to the "Hermitage," near Nashville, Tenn.; always took a deep interest in public affairs.	1845	Dropsy.
Van Buren	Kinderhook, N. Y.	Mar. 4, 1837	Mar. 4, 1841	Was renominated in 1840 for the presidency. Defeated by W. H. Harrison. In 1844 again renominated, but was defeated. In 1845 nominated by Free- Soil party.	1862	Asthma.
W. H. Harrison	North Bend, Ohio	Mar. 4, 1841	Apr. 4, 1841	Died in office.	1841	Pleurisy fever.
Tyler	Williamsburg, Va.	Apr. 6, 1841	Mar. 4, 1845	Retired to his estate in Virginia; presided at the peace convention held in Washington in 1861.	1862	Bilious attacks, with bronchitis.
Polk	Nashville, Tenn.	Mar. 4, 1845	Mar. 4, 1849	Died in office.	1849	Cholera diarrhoea.
Taylor	Baton Rouge, La.	Mar. 4, 1849	July 10, 1850	Died in office.	1850	Cholera morbus and typhoid fever.
Fillmore	Buffalo, N. Y.	July 10, 1850	Mar. 4, 1855	Was candidate for president in 1852 and in 1856; spent his remaining years at Buffalo, N. Y.	1874	Paralysis.
Pierce	Concord, N. H.	Mar. 4, 1853	Mar. 4, 1857	Traveled in Europe; retired to Concord, N. H.	1869	Dropsy and inflam- mation of stomach.
Buchanan	Wheatland, Pa.	Mar. 4, 1857	Mar. 4, 1861	Retired to Lancaster, Pa.; devoted himself to writing defense of his administration.	1868	Rheumatic gout.
Lincoln	Springfield, Ill.	Mar. 4, 1861	Apr. 15, 1865	Died in office.	1865	Assassinated by Booth.
Johnson	Greenville, Tenn.	Apr. 15, 1865	Mar. 4, 1869	Retired to home in Greenville, Tenn.; chosen United States senator in 1875.	1875	Paralysis.
Grant	Washington, D. C.	Mar. 4, 1869	Mar. 4, 1877	Made tour of the world and retired to private life in New York.	1885	Cancer of the tongue.
Hayes	Fremont, Ohio	Mar. 4, 1877	Mar. 4, 1881	Was president of the Board of Freedmen, and president of the National Prison association.	1893	Neuralgia of the heart.
Garfield	Meotator, Ohio	Mar. 4, 1881	Sep. 19, 1881	Died in office.	1881	Assassinated by Guiton.
Arthur	New York City	Sep. 20, 1881	Mar. 4, 1885	Died the year following his retirement.	1886	Bright's disease.
Cleveland	Buffalo, N. Y.	[Mar. 4, 1885 Mar. 4, 1893 Mar. 4, 1889	Mar. 4, 1889 Mar. 4, 1893 Mar. 4, 1893	Retired to New York to practice law; at the end of second term, retired to Princeton, N. J.	1908	Heart failure.
H. Harrison	Indianapolis, Ind.	Mar. 4, 1889	Mar. 4, 1893	Professor of international law at Leland Stanford University, California; afterward practiced law.	1901	Pneumonia.
McKinley	Canton, Ohio	Mar. 4, 1897	Sep. 14, 1901	Died in office.	1901	Assassinated by Coeagan.
Roosevelt	Oyster Bay, N. Y.	Sep. 14, 1901	Mar. 4, 1909	In March, 1909, headed a scientific expedition to Africa, organized in the interest of the Smithsonian institu- tion; resumed literary work and politics.		
Taft	Cincinnati, Ohio	Mar. 4, 1909				



## THE PRESIDENTS OF THE UNITED STATES

to old calendar, the light figures to new

EDUCATIONAL ADVANTAGE	EARLY VOCATION	PROFESSION	RELIGIOUS CONNECTIONS	MARRIED	WIFE'S NAME	CHILDREN		NAME
						Boys	Girls	
Common School	Surveyor	Planter	Episcopalian	1769	Martha (Dandridge) Custie (1732-1802), widow with two children.	0	0	Washington
Harvard College, 1755	Teacher	Lawyer	Unitarian	1764	Abigail Smith (1744-1818).	3	2	Adams
College of William and Mary, 1762	Lawyer	Lawyer	Liberal	1772	Martha (Wayles) Skelton (1748-1782), widow of Nathaniel Skelton.	0	0	Jefferson
Princeton College, 1771	Lawyer	Lawyer	Episcopalian	1784	Dolly (Payne) Todd (1772-1840), widow.	0	0	Madison
Entered College, William and Mary	Lawyer	Politician	Episcopalian	1786	Eliza Kortwright (1768-1830).	0	2	Monroe
Harvard College, 1787	Lawyer	Lawyer	Unitarian	1797	Louisa Catherine Johnson (1775-1852).	3	1	Adams, J. Q.
Self Taught	Lawyer	Lawyer	Presbyterian	1791	Rachel Donelson Robards (1767-1828), divorced with six children.	3	0	Jackson
Academy	Lawyer	Lawyer	Reformed Dutch	1807	Annabell Smith (1783-1819).	4	0	Van Buren
Entered Hampden-Sidney College	Medicine	Army	Episcopalian	1795	Anna Symmes (1775-1804).	6	4	Hayes
College, William and Mary, 1806	Lawyer	Lawyer	Episcopalian	1813	Pirot, to Letitia Christian (1790-1842), second, to Julia Gardiner (1820-1880).	4	2	Tyler
University of North Carolina	Lawyer	Lawyer	Presbyterian	1824	Sarah Childress (1803-1891).	0	0	Folk
Common School	Soldier	Army	Episcopalian	1810	Margaret Smith (1788-1852).	1	3	Taylor
Public School	Tailor	Lawyer	Episcopalian	1826	First, Abigail Powers (1798-1853); second, Caroline Carmichael McIntosh (1813-1881), a widow.	1	1	Fillmore
				1858		0	0	
Bowdoin College, 1824	Lawyer	Lawyer	Episcopalian	1834	Jane Means Appleton (1806-1863), unmarried.	3	0	Pierce
Dickinson College, 1809	Lawyer	Lawyer	Presbyterian	1842	Mary Todd (1818-1882).	1	0	Buchanan
Self Taught	Farmer	Farmer	Liberal	1827	Eliza McCord (1810-1878).	3	2	Lincoln
Self Taught	Tailor	Politician	Liberal	1827	Eliza McCord (1810-1878).	3	2	Johnson
West Point Military Academy, 1843	Tanner	Army	Methodist	1848	Julia Dent (1826-1906).	3	1	Grant
Williams College, 1856	Lawyer	Lawyer	Methodist	1852	Lacy Ware Webb (1831-1889).	2	1	Hayes
Common School, 1848	Teacher	Lawyer	Episcopalian	1858	Lucretia Rudolph (1832—).	4	1	Garfield
Common School	Teacher	Lawyer	Presbyterian	1859	Ellen Lewis Herndon (1837-1886).	1	1	Arthur
Miami University, Ohio, 1851	Lawyer	Lawyer	Presbyterian	1866	Frances Folsom (1864—).	2	3	Cleveland
				1853	First, Caroline Scott (1832-1892); second, Mary (Lord) Dimmick (1858—).	1	1	Harrison
				1896		0	1	
Common School	Teacher	Lawyer	Presbyterian	.....	Frances Folsom (1864—).	2	2	Cleveland
Entered Allegheny College	Lawyer	Lawyer	Methodist	1871	Ida Smith (1844-1907).	0	2	McKinley
Harvard, 1880	Publicist	Publicist	Reformed Dutch	1883	First, Alice Lee (1861-1884); second, Edith Kermit Cawley (1861—).	0	1	Roosevelt
Yale, 1878	Lawyer	Lawyer	Unitarian	1886	Helen Herron (1861—).	4	1	Taft
				1886		2	1	

## THE PRESIDENTS OF THE UNITED STATES

AGE AT DEATH	PLACE OF DEATH	PLACE OF BURIAL	WRITINGS OF THE PRESIDENTS	PRESIDENTIAL SOBRIQUETS	NAME
67	Mt. Vernon, Va.	Mt. Vernon, Va.	<i>Maxims; Transcripts of Revolutionary Correspondence.</i>	<i>Father of his Country;</i>	Washington
90	Quincy, Mass.	Unitarian church, Quincy, Mass.	<i>Essay on Canon and Feudal Law; Defense of the American Constitution.</i>	<i>Colonus of Independence;</i>	Adams
83	Monticello, Va.	Monticello, Albemarle Co., Va.	<i>A Summary View of the Rights of America; The Declaration of Independence; Act for Freedom of Religion.</i>	<i>Son of Liberty;</i>	Jefferson
85	Montpelier, Va.	Montpelier, Hancock Co., Va.	<i>Reports of Debates During the Congress of the Confederation and Federal Congress; Essays.</i>	<i>Scots of Monticello; Long Tom.</i>	Madison
73	New York City.	Originally, 2d Avenue cemetery, N. Y. Transferred, 1855, to Hollywood cemetery, Richmond, Va.	<i>A View of the Conduct of the Executive; The People; The Sovereign.</i>	<i>Father of the Constitution.</i>	Monroe
80	Hall of Congress, Washington, D. C.	Unitarian church, Quincy, Mass.	<i>Poems of Religion and Society; Lectures on Rhetoric and Oratory; Criticisms of Paine's "Rights of Man;" Defense of Washington's Policy of Neutrality.</i>	<i>Last Cocked Hat.</i>	Adams, J. Q.
78	Hermitage, near Nashville, Tenn.	Hermitage, near Nashville, Tenn.	<i>Inquiry Into the Origin and Cause of Political Parties in the United States.</i>	<i>Old Man Eloquent.</i>	Jackson
79	Kinderhook, N. Y.	Village cemetery, Kinderhook, N. Y.		<i>Old Hickory; Czar of the White House.</i>	Van Buren
68	White House, Washington, D. C.	North Bend, Ohio.	<i>A Discourse on the Aborigines of the Valley of the Ohio.</i>	<i>Little Napoleon; Wizard of Kinderhook.</i>	Harrison
72	Ballard House, Richmond, Va.	Hollywood, Richmond, Va.			Tyler
53	Nashville, Tenn.	Nashville, Tenn.			Folk
65	White House, Washington, D. C.	Near Louisville, Ky. (Springfield).			Taylor
74	Buffalo, N. Y.	Forest Lawn, Buffalo, N. Y.			Fillmore
64	Concord, N. H.	Minot cemetery, Concord, N. H.			Pierce
77	Lancaster, Pa.	Woodward Hill cemetery, Lancaster, Pa.	<i>Résumé of My Administration.</i>		Buchanan
56	Washington, D. C.	Oak Ridge cemetery, Springfield, Ill.	<i>Oration.</i>		Lincoln
66	Greenville, Tenn.	Greenville, Tenn.	<i>Speeches.</i>		Johnson
63	Mount McGregor, N. Y.	Riverside, New York City.	<i>Sketch; Vicksburg; Chattanooga; The Wilderness; The Personal Memoirs of U. S. Grant.</i>		Grant
71	Fremont, Ohio.	Fremont, Ohio.			Hayes
49	Elberon, Long Beach, N. J.	Lake View cemetery, Indianapolis, Ind.	<i>Discovery and Ownership of the Northwestern Territory; Garfield's Words.</i>		Garfield
56	New York, N. Y.	Rural cemetery, Albany, N. Y.	<i>Writings and Speeches.</i>		Arthur
71	Princeton, N. J.	Princeton, N. J.			Cleveland
67	Indianapolis, Ind.	Crown Hill cemetery, Indianapolis, Ind.	<i>Speeches; This Country of Ours; Views of an Ex-President.</i>		Harrison
58	Buffalo, N. Y.	Cemetery, Canton, Ohio.	<i>Speeches.</i>		McKinley
			<i>The Naval War of 1812; Essays on Practical Politics; The Binning of the West; Hero Tales From American History; American Ideals; Life of Oliver Cromwell; African Game Trails.</i>		Roosevelt
				<i>The Globe Trotter; The Judicial President.</i>	Taft

## COMPULSORY EDUCATION AND CHILD LABOR LAWS

Statutory provisions relating to compulsory attendance and child labor prepared by the United States Bureau of Education.

COMPULSORY EDUCATION				CHILD LABOR	
State	Age	Annual Period	Penalty on Parents for Neglect	Age Under Which Specified Employments Are Forbidden	Educational Restrictions on Child Labor
Alabama				12 years, in any mill, factory, or manufacturing establishment.	No child, 12 to 16, may work in any mill, etc., unless attends school 8 weeks each year employed.
Arizona	15-16	6 months; 20 weeks consecutive.	\$5 to \$25.	12 years, in all cases in manufacturing establishments, except canning industries in vacation; 14, unless to support a parent or self, as specified by law; 14, in mines; females not at all in mines.	No child, 14 to 18, unable to write, may be employed in a manufacturing establishment unless he has attended school 12 weeks the preceding year.
Arkansas	8-16	Not less than half the full term. Certain counties are exempt.	\$10 to \$25.	14 years, in any mercantile or manufacturing establishment, workshop, hotel, or as messenger, etc. Children 12 to 14, upon permit, may work if parents incapacitated, or during vacation.	No minor under 16 may work for gain in school hours, unless he can read and write English or attends night school.
California	8-14	Full term.	First, not over \$10 or 5 days' imprisonment; subsequent, \$10 to \$50, or 5 to 25 days, or both.	14 years in any underground works, mine, smelter, mill, or factory. No female may be employed in a coal mine.	Unlawful to employ children under 14 during school hours unless they have complied with the school-attendance law; under 16, unable to read and write, unless attending day or night school.
Colorado	18-16	Full term.	\$5 to \$25.	14 years, in any mechanical, mercantile, or manufacturing establishment.	Children under 14 may not be employed while school is in session. Children 14 to 16 can not leave school to be employed, unless their education is satisfactory to the local or state school board.
Connecticut	7-16	Full term.	Not exceeding \$5 each week of absence.	14 years, in any factory, workshop, or manufacturing establishment, except in canning industry, etc., or to support widowed mother.	No child 14 to 16 may be employed, unless he has attended day or night school 12 weeks the preceding year.
Delaware	7-14	8 months (may be reduced by districts to 3).	First, not over \$2; after, not over \$5. (On default imprisonment 2 to 5 days.)	14 years in any factory, workshop, or manufacturing establishment, except in canning industry, etc., or to support widowed mother.	Children under 14 may not do any work for wages during school hours, not under 16 in preceding employments, unless can read, write, and attended school 150 days preceding year.
District of Columbia	8-14	Full term.	Not exceeding \$20.	14 years in any factory, workshop, store, office, hotel, theater, as messenger, etc. Children 12 to 14 may get permit to work in certain cases.	After Jan. 1, 1908, no child under 14 may be employed in a preceding column (with the exception there noted) unless able to write and has attended school 12 weeks the preceding year; under 18, unless so attended school.
Florida				Children under 15 may not be employed more than 60 days without consent of legal guardian.	No child under 14 may be employed in any way during school hours. No minor under 16 may work in a coal mine unless he can read and write and has attended school 3 months in the year.
Georgia				10 years, in or about any manufacturing establishment; 12 years after Jan. 1, 1907, except for support of self or parents in specified cases.	Under 14 may not be employed in any way during school hours; nor from 14 to 16 in stated occupations unless can read and write, and attended school 100 days preceding year.
Idaho	18-16	Full term.	Not over \$300 or imprisonment not over 6 months, or both.	14 years, in any mine, factory, workshop, mercantile establishment, laundry, hotel, etc., except over 12 during vacation.	Children under 14 may not be employed in any way during school hours; nor from 14 to 16 in stated occupations unless can read and write, and attended school 100 days preceding year.
Illinois	7-16	Full term, to be not less than 6 months.	\$5 to \$20 and costs, and stand committed until paid.	14 years, in any mercantile institution, factory, office, theater, elevator, etc., or as messenger or driver; 16, in or about any mine. No female may work in or about a mine.	Children under 14 may not be employed in any way during school hours; nor from 14 to 16 in stated occupations unless can read and write, and attended school 100 days preceding year.
Indiana	7-14	Full term.	\$5 to \$25, and, in discretion of court, imprisonment 2 to 90 days.	14 years, in any manufacturing or mercantile establishment, mine, quarry, laundry, renovating works, bakery, or printing office. No female may work in a mine.	Children under 15 shall not be employed in any manufacturing or mechanical establishment, except during vacation, unless they have attended school 6 months in preceding year.
Iowa	7-14	16 consecutive weeks; first and second class city boards may require full term.	\$3 to \$20.	14 years, in any mine, factory, mill, shop, laundry, packing house, elevator, or store where more than 8 persons are employed.	Children under 14 may not be employed in any way during school hours; nor from 14 to 16 in stated occupations unless can read and write, and attended school 100 days preceding year.
Kansas	8-15	Full term.	\$5 to \$25.	14 years, in any factory, workshop, theater, packing house, or in or about any mine; 16, in any dangerous, etc., employment.	Children under 14 may not be employed in any way during school hours; nor from 14 to 16 in stated occupations unless can read and write, and attended school 100 days preceding year.
Kentucky	17-14	8 consecutive weeks; full term in cities; first, second, third, and fourth class.	First, \$5 to \$20; subsequent, \$10 to \$50.	14 years, in any mine, workshop, factory, store, office, hotel, as messenger, etc.	Children under 14 may not be employed in any way during school hours; nor from 14 to 16 in stated occupations unless can read and write, and attended school 100 days preceding year.
Louisiana				14 years, in any manufacturing or mercantile establishment, mine, laundry, carrying messages, etc.	Children under 14 may not be employed in any way during school hours; nor from 14 to 16 in stated occupations unless can read and write, and attended school 100 days preceding year.
Maine	7-15	Full term.	Not exceeding \$25, or imprisonment not exceeding 30 days.	14 years, in any manufacturing or mechanical establishment.	Children under 15 shall not be employed in any manufacturing or mechanical establishment, except during vacation, unless they have attended school 16 weeks during preceding year.
Maryland	18-12	Full term.	Not exceeding \$5.	14 years, in mills and factories (except canning establishments), unless self, widowed mother, or invalid father solely dependent upon such employment. 18 counties exempt from law. 14 years, day messenger service; 16 years, night messenger service; 21 years, messenger duty to house of ill repute.	No minor 12 to 16, unable to read and write English, may be employed where there is an evening school unless attending that or another school.

## COMPULSORY EDUCATION AND CHILD LABOR LAWS

COMPULSORY EDUCATION				CHILD LABOR	
State	Age	Annual Period	Penalty on Parents for Neglect	Age Under Which Specified Employments Are Forbidden	Educational Restrictions on Child Labor
Massachusetts...	(a)	Full term.....	Not exceeding \$20.....	14 years, in factories, workshops, or mercantile establishments; 21 years, dangerous occupations.	Children under 14 may not be employed at any work for wages during school hours; from 14 to 16 may not be so employed in any factory, workshop, or mercantile establishment if unable to read and write.
Michigan.....	7-16	Full term.....	Fine of \$5 to \$50, or imprisonment 2 to 90 days, or both.	14 years, in any manufacturing or mercantile establishment, workshop, laundry, store, office, hotel, messenger service, etc.	Children 14 to 16 may not be employed unless they have attended school 100 days preceding year, and can read and write and know the elements of arithmetic.
Minnesota.....	8-16	Full term.....	Not over \$50, or imprisonment not over 30 days.	14 years, in factories, mills, workshops, or mines.	Children under 14 years may not be employed in any service during school term; under school age (16 years), in any occupation during school term unless they have attended school the prescribed period; under 16, unable to read and write English, in any indoor occupation (except in vacation) unless attending day or evening school.
Mississippi.....				12 years, in any mill, factory, or manufacturing establishment.	
Missouri.....	m8-14	Not less than 1/4 of term. Full term in cities of over 500,000.	\$10 to \$25, or imprisonment 2 to 10 days, or both.	14 years, in any mine, manufacturing or mercantile establishment, laundry, etc., in cities of over 10,000; no females in mines.	No child 8 to 14 may be employed in any way in school hours unless he has complied with the attendance law. No boy under 16 may work in a mine unless he can read and write.
Montana.....	m8-14	Full term; in no case less than 16 weeks.	\$5 to \$20.....	16 years, in mines or underground works.	Children under 14 not to be employed during school seasons unless they have completed the studies required by law; from 14 to 16, if unable to read and write English.
Nebraska.....	m7-16	Two-thirds of school term; in no case less than 12 weeks. Full term in cities.	\$5 to \$25 (on truant officer)	14 years, in any manufacturing or mercantile establishment, office, hotel, etc.	No child under 14 may be employed in any service during school hours.
Nevada.....	8-14	16 weeks; 8 consecutive.....	First, \$50 to \$100; subsequent, \$100 to \$200; with costs.		
New Hampshire.....	p8-14	Full term.....	First, \$10; subsequent, \$20	12 years, in any manufacturing establishment.	No child under 14 may be employed during school seasons, nor under 16 if unable to read and write English. No minor unable to read and write English may be employed unless attending day or evening school, if any is held.
New Jersey.....	m7-17	Full term.....	Punishable as a disorderly person.	14 years, in factories, workshops, mills, or manufacturing establishments, also mines; 15 years until July 4, 1911, 16 years thereafter, in factories, etc., between 6 p. m. and 6 a. m.	Children under 15 must have attended school 12 weeks the preceding year as a condition of employment.
New Mexico.....	7-14	Full term.....	\$5 to \$25, or imprisonment not exceeding 10 days.		
New York.....	7-16	Full term (not less than 160 days) in districts of over 5,000 population having a superintendent, for children 7-16 r. elsewhere, for children 8-16, Oct. 1 to June 1, r.	First, not over \$5 or imprisonment 5 days; subsequent, not over \$50 or imprisonment 30 days, or both.	14 years, in factories; if 14 to 16, the child must have attended school 130 days the preceding year, and be able to read and write English, and either. Similar provisions apply, in places of over 3,000 population, to work in mercantile establishments, business offices, restaurants, hotels, express or messenger service, except for children over 12 in small places during vacation. For work in or about mines 16 years is the minimum. No female may work in a mine.	Unlawful to employ in any business or service child under 14 during school term; or one 14 to 16 in city of first or second class unless he has employment certificate (having certificate and not having completed elementary course, must attend evening or trade school); or one 14 to 16 elsewhere, in any factory, etc., unless has employment certificate, or in any service unless has certificate of school attendance, etc.
North Carolina.....	8-14	16 weeks.....	\$5 to \$25.....	12 years, in any factory or manufacturing establishment (does not apply to oyster canning and packing); 12 years, in mines employing over 10 men (boys); children 12 to 13 may be employed in factories only as apprentices.	Apprentices 12 to 13 years must have attended school 4 months in preceding 12.
North Dakota.....	8-14	Full term.....	\$5 to \$20 (on school official).	14 years, in mines, factories, workshops, mercantile establishments, etc.	Children under 14 may not be employed in any manner during school term, or those 14 to 16 unless they have attended school 120 days preceding year and know the elementary branches.
Ohio.....	m8-14	Full term; in no case less than 28 weeks.	\$5 to \$20; on default, imprisonment from 10 to 30 days.	14 years, in any factory, workshop, business office, mercantile establishment, hotel, or messenger, etc.; 16 years, messenger service between 9 p. m. and 6 a. m.	No child between 14 and 16 may be employed in foregoing occupations without a schooling certificate.
Oklahoma.....	8-16	3 to 6 months.....	\$10 to \$50.....	16 years, in mines (no girls in mines).	
Oregon.....	m8-14	Full term.....	\$5 to \$25 fine, or imprisonment 2 to 10 days, or both.	14 years, in any factory, store, workshop, in or about any mine, or in the telegraph, telephone, or public messenger service.	Foregoing employments forbidden to any child 14 to 16 unless attended school 100 days preceding year and can read English. No child under 14 may be employed in any work for compensation during school hours.

## COMPULSORY EDUCATION AND CHILD LABOR LAWS—Continued

COMPULSORY EDUCATION				CHILD LABOR	
State	Age	Annual Period	Penalty on Parents for Neglect	Age Under Which Specified Employments Are Forbidden	Educational Restrictions on Child Labor
Pennsylvania....	26-16	Full term; but the school board may reduce this to not less than 70 per cent of the term.	First, not exceeding \$2; subsequent, not exceeding \$5; on default, imprisonment; first, not over 5 days; subsequent, not over 5.	14 years, in any employment, except domestic or farm labor. Girls may not work in or about coal mines.	No child 14 to 16 may be employed unless he can read and write English and has complied with the school laws.
Rhode Island....	97-15	Full term.....	Not exceeding \$20.....	14 years, in any factory, manufacturing or business establishment.	Children under 13 may not be employed except during school vacations.
South Carolina.....				12 years, in any factory, mine or textile establishment, except that certain self-dependent children may work in the latter.	Children may work in textile establishments in June, July, and August if they have attended school 4 months during the year and can read and write.
South Dakota....	78-14	Full term; but districts may reduce it to 16 weeks, 12 consecutive.	\$10 to \$20 and costs; stand committed till paid.	14 years, in mines.....	No child 8 to 14 to be employed during school hours unless he has attended school 12 weeks during the year.
Tennessee.....	8-14	4 months or 80 days consecutively.	First offense, \$1 for each day of absence.	14 years, in workshops, factories, or mines.	Unlawful to employ children 12 to 14 who can not read and write English, in mills, factories, etc. certain self-dependent children excepted.
Texas.....				12 years, in mills, factories, manufacturing or other establishments using machinery; 16 years in mines, distilleries, or breweries.	
Utah.....	8-16	20 weeks, 10 consecutive; in cities of the 1st and 2d class 30 weeks, 10 consecutive.	First, not exceeding \$10; subsequent, not exceeding \$30, with costs.	14 years in mines (constitution of state).	
Vermont.....	25-15	Full term.....	\$5 to \$25.....	12 years, for any railroad company or in any mill, factory, quarry, or workshop, or carrying messages.	No child under 16 who has not completed the 9-year school course may be employed in any railroad, factory, mine, or quarry work, or in delivering messages, except out of school hours.
Virginia 25.....	8-12	12 weeks.....	First, \$2 to \$10; subsequent, \$5 to \$20.	13 years, after March 1, 1909; 14 after March 1, 1910, in any factory, workshop, mercantile establishment, or mine, except in certain cases of need over 12.	
Washington.....	8-16	Full term.....	Not over \$25.....	14 years, (boys), 16 years (girls), at any labor not connected with house or farm work; 16 years in mines (girls not at all).	Children under 15 may not be employed during school hours unless exempted by the school superintendent.
West Virginia....	8-14	20 weeks.....	First, \$2; subsequent, \$5..	12 years, in factories, workshops, mercantile or manufacturing establishments; 14 in mines (no girls may work in mines).	No child under 14 shall be so employed during school term if it hinders regular attendance.
Wisconsin.....	7-14	Full term in 1st class cities; in 2d class cities not less than 8, elsewhere not less than 6 school months.	\$5 to \$50 and costs, or imprisonment not over 3 months, or both.	12 years, in any occupation; 14, in factories, workshops, mines; 14 to 16, in any occupation without specified written permit.	Children 12 to 14 may not be employed in any occupation, except during school vacations by specified written permit, in stores, offices, hotels, mercantile establishments, laundries, or public messenger service, where they reside (does not apply to farming or other outdoor work).
Wyoming.....	77-14	Full term.....	Not exceeding \$25.....	14 years, in mines; females may not work in mines. (Constitution.)	
United States laws (for territories).				12 years, in the underground workings of any mine.	

a To 16, if unable to read and write English.

b Children 14 to 16 whose labor is necessary to their own or parents' support are excused.

c Not applicable to children over 14 lawfully employed to labor at home or elsewhere.

d Except children over 14 who have completed eighth grade, or have to support themselves or parents, or have other good cause to be exempt.

e Children 14 to 16 necessarily and lawfully employed are exempt.

f Inclusive.

g 8 weeks for children over 14 who can read and write English and are at work to support themselves or others.

h To 16 in cities of first, second, third, and fourth classes; holders of employment certificates excepted.

i The provisions tabulated for Maryland (except in 5th column) are of the act of 1902, whose operation is limited to Baltimore city and Allegany county.

j To 16 unless regularly employed to labor at home or elsewhere.

k To 16 if wandering about public places without lawful occupation, or if unable to read and write.

l Must be able to so read and write as is required to enter the second grade in 1906, third in 1907, and fourth in 1908 and after.

m To 16 years for children not lawfully, regularly, and usefully employed.

n To 16 if unemployed.

o To 16 years in cities.

p To 16 if unable to read and write English.

q Does not apply to children over 15 who have finished grammar-school course and are regularly employed; otherwise must attend grammar, or high, or manual-training school. Children over 14 may be employed in cases of necessity.

r Does not apply to children 14 to 16 lawfully employed.

s Other forbidden employment: under 16, on certain machines in box factories; under 21, night messenger service in certain cities; under 16, in bowling alleys and in places of amusement at night.

t Law does not take effect in any county until voted by the county; does not apply to children over 12 lawfully employed at home or elsewhere.

u To 16 if not legally employed or if unable to pass fifth grade test in required subjects. Children in cities who have not completed eighth grade may be required to attend until they are 16.

v In the discretion of school boards.

w To 16 if unemployed.

x Not applicable to children over 13 who can read and write English and are regularly employed in useful service.

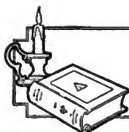
y Not applicable to children over 12 who are lawfully employed.

z The compulsory attendance act applies to 18 counties, in addition to which 13 counties are under special laws.

aa Children over 15 or under 8, when once enrolled, must attend the full term they are enrolled for.

ab Compulsory attendance law optional with the voters of any county, city, or town.

ac Children under 17 may not be sent to immoral resorts.



# TRADE AND INDUSTRY



**AGRICULTURE** is the oldest and most important industry. It is an art of tilling the ground, the planting, cultivation and harvesting of crops, and includes fruit-growing or horticulture, animal husbandry, or the rearing, breeding, feeding and management of the domesticated breeds of live stock, as well as the manufacture or evolving from products of the soil articles for home consumption or purposes of commerce. By it humanity is fed and clothed, and it contributes in many other ways to the welfare and wealth of the world. Without agriculture man would be a barbarian and the earth a wilderness.

The knowledge that centuries of research and practice give, the light contributed by agricultural chemistry, supplemented by new and improved machinery and modern transportation facilities, have greatly enlarged the productions and possibilities of agriculture; and its problems, the mysteries of the soils, and of animal and plant life are engaging the best intellect.

**Acreage Yields.**—While in the aggregate of field productions the United States ranks first, America does not compare favorably with older countries in acre-yields. To compass this a more scientific farming, more educated farmers, more thorough tillage and cultivation, careful seed selection, proper fertilization, and rational crop rotation must be the agencies; in fact a more intimate knowledge and use of the underlying principles governing soil fertility, and crop and live stock production. What this would mean finds illustration in the examples afforded by England and Germany in wheat-growing, with averages of 32.2 and 26.1 bushels per acre, respectively, compared with the 14 bushels per acre in the United States, from a soil naturally as fertile and as well adapted as any.

**Home and Foreign Markets.**—In the settlement and development of America the millions of acres of fresh land brought into production yielded more than domestic consumption required, which caused the seeking of markets elsewhere for the surplus, and the resulting export trade has been a wellspring of prosperity. There are signs, however, that American farmers will not so largely depend for profits in the future upon foreign demands, as home requirements are annually increasing. A case in point is the constantly lessening difference between the production and home consumption of wheat.

In the five-year period of 1894-8 exports from the United States averaged 32 per cent of annual production, and in 1904-8 had fallen to 17 per cent, while the average annual production was 535,387,000 bushels for the first period, and 665,959,000 bushels in the latter. Deducting the average yearly exports for each period it is shown that the consumption of wheat at home increased 50 per cent. Also, for 1909, the value of agricultural exports was \$903,000,000, or \$151,000,000 below the highest record, made in 1907, and \$114,000,000 below the next highest, in 1908, while on the other hand the imports of agricultural products were never so high

in value, the amount being \$637,000,000, in 1909.

**Soils and Their Fertilization.**—Naturally the soil is and must be of primal importance. Plants obtain their food from the soil, and atmosphere, and the mineral elements in the soil are utilized only through the plant roots. If requisite elements are lacking yields are less, however much of a factor tillage may be. Without proper proportions of plant food available in the soil, tillage and good seed do not suffice to maintain it in a high state of productivity, and a supply of suitable plant food must be maintained if maximum yields are to be realized.

**Chemistry of Soil.**—Vegetation requires carbon and oxygen, taken into the plant leaves from the air as carbon dioxide; hydrogen, a constituent of water absorbed through the plant roots; nitrogen, taken from the soil by all plants and also from the air, especially by legumes; and potassium, phosphorus, magnesium, calcium, iron and sulphur, drawn only from the soil.

Of these, nitrogen, the most expensive element of plant food, although comprising four-fifths of the atmosphere, is perhaps the one becoming the most seriously deficient in the ordinary soils of the wheat and corn growing sections, due largely to continuous grain-growing, resulting in a loss of vitality and dwarfed growth.

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**Phosphate.**—One eminent soil expert says: "To increase the value of farm manure we should add phosphate to it. Thus we can balance manure, and when used on soils rich in potassium, in rotation with nitrogen-fixing legume crops, we can provide plant food in a balanced ratio to meet the needs of maximum yield. By these means we can check the progress of soil exhaustion, and even gradually increase the fertility and productive capacity of the land. Indeed, we can thus profitably enrich such land even beyond its virgin fertility," and, again "... land may be built up and be made richer than it ever was by a good system of strictly grain farming." The experiment stations are successfully solving these problems.

**Humus,** decaying vegetable or animal matter, is the great storehouse of nitrogen, and is also an indispensable element in soils, not so much because of its direct nourishment to plants but because it helps to render other materials available for the growing crops. It is humus that gives life and heart to the soil, improves its physical condition, its tilth and texture, augments its water-holding capacity, gives its dark color, modifies extremes in its temperature, facilitates the entrance of air, and is what most worst lands suffer for want of.

**Commercial Fertilizers,** by which are provided artificial plant food, are in common and extensive use where lands have been depleted and crop production decreased, as on the tobacco and cotton lands of the Southern States, acting as a sort of medicine or stimulant to the soil, but many of them have little or no further influence than is evidenced in the increase of a single season's crops or crop.

Composition of the Principal Commercial Fertilizing Materials

FERTILIZING MATERIAL	NITROGEN	PHOSPHORIC ACID			POTASH	CHLORINE
		Available	Insoluble	Total		
Supplying nitrogen:	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
Nitrate of soda	15.5-16.0					
Sulphate of ammonia	19.0-20.5					
Dried blood (high grade)	12.0-14.0					
Dried blood (low grade)	10.0-11.0			3.0-5.0		
Concentrated tankage	11.0-12.5			1.0-2.0		
Fish-lime (bone)	10.0-11.0			11.0-13.0		
Dried fish scrap	7.0-9.0			6.0-8.0		
Cotton-seed meal	6.5-7.5			1.5-2.0	2-3.0	
Castor pomace	5.0-6.0			1.0-1.5	1-1.5	
Supplying phosphoric acid:						
South Carolina rock phosphate			20-25	26.0-28.0		
South Carolina rock superphosphate (discolored South Carolina rock phosphate)		12-15	1-3	13.0-16.0		
Florida land rock phosphate			32	33.0-35.0		
Florida pebble phosphate			26-32	26.0-32.0		
Florida superphosphate (discolored Florida phosphate)		14-16	1-4	16.0-20.0		
Boneblack			32-36	32.0-36.0		
Boneblack superphosphate (discolored boneblack)		15-17	1-2	17.0-18.0		
Ground bone	2.5-4.5	5-8	13-17	20.0-25.0		
Steamed bone	1.5-2.5	6-9	16-20	22.0-29.0		
Dissolved bone	2.0-3.0	13-15		15.0-17.0		
Thomas slag				11.4-23.0		
Supplying potash:						
Muriate of potash					48-52.0	45.0-48.0
Sulphate of potash (high grade)					48-52.0	0.5-1.5
Sulphate of potash and magnesia					20-30.0	1.5-2.5
Kainit					12-12.5	30.0-32.0
Sylvinit					16-20.0	42.0-46.0
Cotton-bull ashes					7.0-9.0	20-30.0
Wood ashes (unleached)					1.0-2.0	2.0-2.5
Wood ashes (leached)					1.0-1.5	1-2.0
Tobacco stems	2.0-3.0			3.0-5.0	6-8.0	

The following table is given, showing the amount of fertilizing constituents in one ton of various agricultural products, if returned to the land in the form of manure:

FARM PRODUCTS	NITROGEN	PHOSPHORIC ACID	POTASH
Timothy hay.....	19.2	7.2	25.2
Clover hay.....	29.4	8.0	35.0
Alfalfa hay.....	53.2	10.8	49.2
Cowpea hay.....	79.6	13.2	47.2
Field corn fodder.....	17.2	7.2	21.4
Corn silage.....	8.4	2.4	6.6
Wheat straw.....	8.0	2.6	14.8
Rye straw.....	10.0	5.8	15.8
Oat straw.....	13.0	6.0	24.4
Wheat.....	34.6	19.2	7.0
Rye.....	32.4	16.2	10.4
Oats.....	36.2	15.4	11.4
Corn.....	29.0	32.2	7.2
Barley.....	29.0	35.4	9.0
Wheat bran.....	51.2	56.4	33.4
Linseed meal.....	108.6	37.6	26.2
Cotton seed meal.....	142.8	61.8	36.4
Potatoes.....	7.0	3.2	11.4
Milk.....	10.2	3.4	3.0

**Kinds of Soils.**—Generally a soil well drained, with a sandy or gravelly subsoil, is adapted to tree and fruit growing. The deep alluvial prairie lands are premier for corn, and the rather drier and more compact soils, containing liberal proportions of lime and clay, are especially prized for wheat. Soil alone, however, does not determine the kinds of crops that should be raised.

**Rainfall.**—Over a large portion of America the precipitation is ample for the requirements of agriculture, but owing to wide variation in the yearly rainfall some sections have too much and others too little. In some of the plains regions west of the Missouri river, and elsewhere as well, precipitation is comparatively scant, but over considerable of these the greatest proportion of the yearly rainfall comes in the crop-growing season.

All localities are subject to vagaries of the weather, but their harmful effects are minimized by the knowledge that experience and study have brought. Diversity of crops, scientific methods of preparation and tillage best adapted to the particular locality, drainage and irrigation are being utilized through a better understanding, and have large influence on the general welfare.

**Irrigation and Drainage.**—Irrigation is the artificial watering of land to increase production, or make available for agriculture lands that otherwise would be too dry. Artificial watering of the land has been practiced from earliest times in the older countries, and even by the prehistoric people of some portions of what are now the United States.

Mormons, beginning late in 1840, in Utah, were the first modern people to demonstrate the practicability of extensive irrigation in America, and from their modest beginnings farming and fruit-growing by irrigation have slowly but continuously been extended until the nation, states, municipalities, companies and individuals are all interested in irrigation enterprises in the regions of insufficient rainfall. Authorities state that in 1860 about 100,000 acres of land were under irrigation in the United States, while in 1910 there were being irrigated over 10,000,000 acres, and more than 15,000,000 acres capable of irrigation were under completed canals and reservoirs.

The National Reclamation Law of 1902 gave great impetus to such undertakings in the United States. By its provisions the proceeds from sales of public lands in fourteen states and two territories have been used in the construction of irrigation

systems. In each of these the reservoirs are essential parts, storehouses for the collected flood-waters thereby made usable when needed for lands otherwise barren. Most of the irrigated lands are supplied by gravity with water from reservoirs and surface streams, although the lands watered by artesian wells are not unimportant, and those irrigated by pumping from wells by wind-power and gasoline engines are increasing, especially where immeasurable quantities of water, popularly called the underflow, lie near the surface. The applying of water in the United States is quite generally by checks, flooding and furrows, and in all skill and judgment are required, the character and situation of the soil and the crops planted being governing factors.

**Drainage,** by either natural or artificial means, has for its principal object the removal of excess water from the land, to make it more productive. Many tracts already producing would be greatly enhanced in value if some practical system of soil drainage were installed. The most efficient method is by the use of porous tiles, buried at proper depths and distances apart in the ground. In times of too much water they quickly carry off the surplus, early leaving the surface in condition for cultivation, and in times of drought permit such action of the earth's vapors as to accumulate moisture in the soil.

**Underdrainage.**—The practice of underdrainage is old, but the use of specially made burnt clay tiles for the purpose is comparatively recent. Such lands, for instance, as are full of water for the first two or three feet below the surface, or those where water stands on the surface after heavy rains, are greatly improved by tile methods, and water which was formerly probably employed to carry off surface water. Properly drained fields obviously present many advantages. Even in lands under irrigation the circulation of water in the soils is quite necessary, to prevent injurious accumulation of soluble substances having unfavorable effects. Fortunately, most lands have natural underdrainage, but without this the removal of the excess water by tiles is to be commended.

Ground too wet is generally cold, often sour, and unfriendly to plant growth, whereas well drained land, containing the moisture held by capillarity, has appreciably more warmth and needed aeration. These conditions not only increase its powers for developing and yielding plant food, but the soil being warmer, promotes the germination of seeds and gives thrifter, healthier plants. In ordinary seasons it enables preparation, planting, cultivating and harvesting to be done at such times as experience has shown best.

**Tillage and Dry Farming.**—It is quite probable that low yields and failures of crops are more generally due to inadequate and improper tillage than to any other part of the farmer's work. Proper seed, a soil of average fertility, its timely and proper preparation and subsequent tillage, where crops are cultivated during their growth, very materially determine yields.

Good soils often fail of compensating returns because of poor tillage. It is through the processes aided by cultivation that plant food is available and utilized. Sowing or planting the staple crops on unbroken sod would be unprofitable. By tillage the soil is not only aerated and pulverized but moisture is conserved.

The action of air and moisture in the soil brings about such changes that the otherwise largely unavailable food elements are liberated for assimilation by plants through their roots. Hence, the importance of thorough and scientific tillage for all crops, for yields are materially influenced by the frequency and kind of cultivation given.

**Dry Farming.**—This is all the more imperative in those regions of scant rainfall, and in those in recent years have been adopted a system of culture that makes production more certain and more abundant. This is popularly called "dry farming," the principles of which have been practiced from the most ancient times.

Dry farming means simply proper tillage, an outstanding feature being suitable preparation of the soil for the reception and retention of the natural precipitation. By providing a loose, finely pulverized surface, or dust blanket, capillary attraction with the moisture beneath is broken, lessening evaporation and promoting proper percolation.

Where irrigation is impracticable for lack of water, as in the major portions of the semiarid regions, such methods prove advantageous, and by conservation the natural rainfall is made sufficient for yields that otherwise would have been impossible. Its general principles might be profitably adopted everywhere, and are absolutely essential to remunerative results in regions of scant rainfall.

**Agricultural Education.**—Recognizing agriculture as the country's chief industry, Americans early evinced interest in agricultural education, which took practical form in the organization of societies for its promotion. Washington, the first president of the United States, strongly urged upon Congress the wisdom of providing ways and means for agricultural research and dissemination of the useful knowledge acquired, and he was a member of the first society formed, in 1785, for the advancement of agriculture in America.

This was the nucleus from which has developed the comprehensive agricultural educational system of our day, reaching its highest efficiency in the present excellent colleges and schools maintained in the interest of husbandry, with their elaborate curricula, extensive equipment, and army of capable instructors. Now, also, nearly every farming community has an agricultural or similar association. State, county and district fairs have been educators; nearly, if not all, the states have their boards of agriculture or their equivalent, supported by public funds, and from these institutions are issued, free, a great variety of literature to those interested in rural pursuits.

**Agricultural Literature.**—In the same time there has been developed through private enterprise an extensive agricultural literature, of general and special work and periodicals, many of which are devoted wholly to some one branch of farming, as dairying, a single breed of live stock, orcharding, market gardening, and the like. Farmers' institutes, the agricultural college short courses and extension work, instruction by correspondence and home reading courses and other kindred methods, all aid in teaching the why and wherefore of the business of farming.

**Extension Education.**—A number of colleges, with the cooperation of interested railroads, carry the gospel of better farming direct to those who cannot attend the schools, by sending out train specialists,





1 Cotton Flower and Boll.  
2 Coffee Plant.

3 Mate.  
4 Tobacco.

5 Sugar Cane.  
6 Tea Plant.

7 Cinchona.  
8 Cacao, Flowers and Fruit.

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known as seed, wheat, dairy, corn, alfalfa, or poultry trains, depending on the topic selected for presentation. These trains are properly equipped and manned with college specialists, who lecture at the different railroad stations visited, and answer such questions as may be propounded, illustrating their lectures and answers by examples, specimens, diagrams, charts and tables—a method of teaching found extremely popular.

#### United States Department of Agriculture.

The head of the agricultural educational forces in the United States is the National Department of Agriculture, which was established in 1862 as a bureau, under direction of a commissioner, and in 1889 by an act of Congress made an executive department of the government under a secretary, appointed by the President, and who is a member of his cabinet. The work of its extensive corps of scientists and experts is principally for the nation as a whole, while that of the colleges and experiment stations chiefly concern the advancement of agriculture in the states in which they are respectively located. The national department issues bulletins, reports and other literature from its specialized bureaus, some free and others for which only nominal charges are made. The most popular are the "Farmers' Bulletins" and the "Yearbooks," both free, the latter obtained generally by application to members of Congress.

**Agricultural Colleges.**—While there were a number of agricultural colleges and schools supported mostly by private funds and popular subscriptions previously, the Land Grant act of 1862, by which Congress donated public lands to states and territories providing agricultural colleges, laid the broad foundation upon which have been built institutions for teaching agriculture and the mechanic arts in every state and territory. Supplemental to this endowment the states make liberal appropriations for furthering the work.

To Michigan belongs the distinction of having the oldest agricultural college in the United States, it having been created by legislative enactment in 1855, and formally opened in 1857. Nearly one-half of such colleges are connected with their state universities, and the others are separate, or are parts of technical or industrial instituti.

**Curricula.**—Their curricula embody many distinct courses, pertain to nearly every conceivable phase of farm affairs, and provide for teaching the sciences related to the various industries of farm, shop and home. Chemistry, physics, bacteriology, botany, entomology, zoology, mechanics, and kindred studies, are prominent. Courses comprehend among others the study of soils, soil physics, crops and their production, farm mechanics and farm management; animal husbandry, or the origin and history of the various breeds of domesticated animals and their characteristics, care, feeding, breeding and management; dairying, horticulture, veterinary science, mechanical engineering, electrical engineering, and domestic science and art.

**Agricultural Experiment Stations,** as the term would imply, are for conducting agricultural experimental investigations. They are generally connected with the agricultural colleges, and the members of the faculties of the colleges usually comprise the staff of the station. The first of the regularly organized experiment stations was in Connecticut in 1875, followed by others elsewhere.

In 1887 Congress passed the Hatch act, which gave \$15,000 a year for the maintenance of each agricultural experiment station, for experimentation, investigation, and the compilation and reporting of results.

**Purpose and Work.**—The law specifically states that these stations shall "conduct original researches or verify experiments on the physiology of plants and animals, the diseases to which they are severally subject, with remedies for the same; the chemical composition of useful plants at their different stages of growth, the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and manures; the chemical composition of manures; natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses for forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese, and such other researches or experiments bearing directly on the agricultural industry of the United States, as may in each case be deemed advisable."

In 1906 Congress passed the Adams act, having for its object extension and strengthening of the experimental work of stations by additional funds. By its provisions an initial appropriation of \$5,000 was to be increased each year until 1911, when it would amount to \$15,000, thereafter to be annually available. The aggregate \$30,000 of government funds for each station, under the Hatch and Adams acts. Several states have two stations, one being supported wholly with state funds, and several maintain branches of the government stations.

**Publication of Results.**—Results of the work of these stations are published in bulletins and circulars sent free to those who desire them. While the agricultural colleges and stations are in a sense separate institutions, their property and work are more or less closely interwoven, to their mutual advantage, the colleges profiting from the work of the stations, and the stations from the gratuitous use of the college farms, buildings, apparatus and equipments.

**Plant Breeding, and Seeds.**—A work of great importance carried on by experiment stations is that of improving crops in both yield and quality. Knowing that through the process of selection based on chemical analysis the sugar content of the sugar-beet has been increased from about 5 per cent to 16 per cent, the idea was advanced that the chemical composition of corn might be similarly changed. Experiments showed that it could be done at will, either to a high or low protein, oil content, or other constituent; that a corn rich in protein had an added value for feeding to growing animals; the corn with the larger oil content was of special worth in fattening animals, and the increase of carbohydrates rendered it more valuable for manufactures, as for starch, glucose, and other articles. Similarly, wheat had been improved for flour-making by increasing the gluten content, and such possibilities in plant-breeding seem well-nigh limitless.

**Value of Selected Seed.**—The wisdom of using seed selected according to approved standards has already been convincingly

demonstrated, through improved quality and increased yields. Several states, notably Minnesota, Illinois and Kansas, have by these methods materially enlarged their yields of wheat and corn. Experience has shown, too, the advisability of planting only such seeds as have been graded, and tested for germination, so that a given quantity may be planted uniformly on a given area, with reasonable assurance of definite results.

**Imperfect Viability of seeds** cannot be detected by mechanical examination alone, but the testing box tells in advance of the field planting. The importance of this is emphasized by the illustration that if seed corn, for instance, was only 90 per cent germinable, it would mean the vacant places in the field would aggregate 10 per cent of the area, or ten acres out of a hundred which would produce nothing, due to an uneven and imperfect stand because of the 10 per cent of worthless seed. Lacking good seed there can be no successful agriculture. (See also *Elementary Agriculture*, under Education.)

**Status of the United States in Agriculture.**—It aggregates of field production the United States is without a peer among the nations. Although the capabilities of some parts are as yet but poorly comprehended, the possibilities of others scarcely suspected, and developments superficial, owing to the large holdings by corporations as well as by individuals, and the variant conditions that had to be understood before they could be dealt with, the achievements of the past promise to be far surpassed by the enlightened husbandmen of the future.

**Rank Among Our Industries.**—The country's progress and development agriculturally is suggested by the fact that the aggregate of Indian corn raised in 1909 in the United States was considerably more than that in 1875. In 1875, with a yield of 308,103,000 bushels, it assumed first rank in wheat in 1875; in 1909 the yield was 737,189,000 bushels, or 139 per cent greater. The 1901 crop, however, of 748,460,000 bushels was the largest ever produced, the 1909 crop being next.

In quantity and value the agricultural products of the United States exceed those from any other source. In three-score years they have advanced from the point of not equalling home demands to that of making the United States the world's largest exporter of farm products. In the aggregate of products American agriculture rivals that of all Europe. The farms not only contribute abundantly for home needs, and provide export commodities overshadowing in value all others combined, but supply the manufacturers of the country with raw materials, although, as already stated, the ratio between production and consumption at home has been gradually narrowing.

**Exports.**—For the year ending June, 1909, the value of farm products exported from the United States was \$903,000,000, of which live stock and their products were an important part. Large amounts of domestic animals, especially cattle and sheep, and immense shipments of dressed meats go to foreign ports constantly. Cotton is the leading export crop, the quantity thus disposed of in 1909 amounting to 4,448,000 pounds, valued at \$147,300,665. In 1909 the live animals exported aggregated in value \$22,645,438, while that of packing house and dairy products reached nearly \$173,500,000.

TABULATIONS ON AGRICULTURE, HORTI-  
TABLE I.

CROP	SOIL	PLANTING DATE	SEED TO ACRE	AVERAGE YIELD PER ACRE	ORIGIN AND BRIEF HISTORY	USE
<b>Alfalfa.</b> <i>Medicago Sativa.</i> Linn. <i>Leguminosa.</i>	Deep, well-drained, nonacid, fertile, with deep, permeable subsoil.	May-July north March-May, Aug.-Oct. south.	20-25 pounds broadcast. 15-20 pounds drilled.	3 tons.	Is native to southwestern Asia and was in use centuries before Christian era. Spread from Media to Greece about 480 B. C. Italy first century A. D., Spain eighth century, Mexico and South America sixteenth century. Was introduced from Chili into California in 1854. Came from Mexico to Texas early part of nineteenth century.	Stock feeding. Pasture. Soil-improvement. Soil improvement.
<b>Barley.</b> <i>Hordeum sativum.</i> Linn. <i>Graminea.</i>	Old, well-subsoiled land, not soggy. Rich clay loam best.	April-May north March-April, September-March, south.	1.5 to 2.5 bushels.	25.5 bushels.	Supposed to be native of western Asia, and widely grown before Christian era. Use as a broadplant universal throughout Europe, Asia and Africa to close of fifteenth century.	Maiting purposes. Hay and grain. Food for domestic animals. Human diet. Malt-sprouts and brewers' grains are by-products.
<b>Buckwheat.</b> <i>Eragrostis esculentum.</i> Munich. <i>Polygonacea.</i>	Rather light, well-drained, and not overrich. Will grow in wide range, including poor land.	May-July 15.	3-5 pecks.	18.1 bushels.	Native of Europe and northern Asia. Has been cultivated for centuries in all grain-producing countries. Is found wild in China and Siberia, and has been grown in China for food from time immemorial.	Flour for human food. Honey plant. Grain for poultry. Middlings a by-product for stock feeding.
<b>Clover, Alsike.</b> <i>Trifolium hybridum.</i> Linn. <i>Leguminosa.</i>	Deep clay loam. Will do well on moist and cool land.	March-August.	8-15 pounds alone. 4-6 pounds on wheat or rye in spring.	1.5 tons hay. 4 bushels of seed.	Takes its name from parish in South Sweden. From there probably introduced into England. Is found in Europe, northern Africa, western Asia. Reached America from Great Britain of Scandinavia.	Hay. Pasture. Silage. Honey plant. Soil improvement.
<b>Clover, Red.</b> <i>Trifolium pratense.</i> Linn. <i>Leguminosa.</i>	Sweet medium clay loam, underlain with moderately porous clay subsoil. Moist and abundant humus.	March-August.	15 pounds alone. 8-14 pounds on small grain in spring.	1.5 tons hay. 3-6 bushels of seed.	Probably native to Europe. Introduced into England early in seventeenth century. Doubtless introduced into America by early colonists.	Hay. Pasture. Soiling. Silage. Soil improvement.
<b>Clover, White.</b> <i>Trifolium repens.</i> Linn. <i>Leguminosa.</i>	Light clay loam, sweet.	March-August.	10-12 pounds alone. 2-4 pounds in mixtures.	1.5 tons hay. 2.5 to 6 bushels of seed.	Indigenous to Europe, northern America and probably western Asia. Grows in every country in Europe and throughout America. Best in moderately cool, moist climate.	Lawn grass. Pasture. Honey plant. Short hay. Soil improvement.
<b>Corn.</b> <i>Zea mays.</i> Linn. <i>Graminea.</i>	Fertile, medium loam. New lands preferable.	May-June north. Late March, south.	6 quarts to 1 bushel. 9-11 quarts for silage.	25.4 bushels.	Originated in Mexico. Found in cultivation and principal food of Indians by first explorers of North America. Is related botanically to a native Mexican grass, <i>Euchloa mexicana</i> .	Human food. Stock feeding. Grain for poultry. For manufacture of glucose, dextrine, alcohol, starches, grits, hominy, oil, etc.
<b>Cotton.</b> <i>Gossypium hirsutum.</i> Linn. <i>Malvacea.</i>	Fertile clay or sandy loam, with a clay subsoil at a depth of about two feet.	April-May 15.	1/2 to 1 bushel.	0.5 bale.	Origin antedates recorded history. Supposed to have originated in India, or possibly China. Found in various countries of southern Asia and Africa, and Columbus and other explorers found it native in West India, South America and Mexico. First cultivated in United States in colony of Virginia, 1621.	Manufacture of cloth, thread and yarn. Cottonseed oil. Cottonseed meal, oil cake and hulls for stock feed.
<b>Cowpea.</b> <i>Vigna unguiculata.</i> Walp. <i>Leguminosa.</i>	Wide range, sandy and loamy soils preferred.	May-June north. May-July south.	1 to 1.5 bushels. 3 pecks for seed.	1.5 tons. 10 bushels of seed.	Native of India and region northward to southern part of trans-Caspian district. Has been cultivated more than 2,000 years. Reached West India later part of seventeenth century, and mainland of America later.	Soil improvement. Forage. Seed food for man and domestic animals. To fit land for sod.
<b>Mangel.</b> <i>Beta vulgaris.</i> Linn. <i>Chenopodiacea.</i>	Wide range, deep alkaline loam preferable. Good preparation of seed-bed essential.	April-May	5-8 pounds.	24 tons.	Considered direct descendant of chard, used as vegetable by Greeks 300 B. C. Use of root for rattle feeding recorded in sixteenth century. Beets introduced in America by early colonists.	Stock feed.
<b>Millet.</b> Many groups and varieties. <i>Graminea.</i>	Fertile, mellow clay loam.	April-July.	1-3 pecks drilled.	1.5 tons.	Cultivated in China since 2800 B. C. Still largely grown in oriental countries as food grain and forage. In America, usually grown as supplementary or catch-crop.	Hay. Forage. Soiling. Silage. Pasture. Seed for stock feed.
<b>Oats.</b> <i>Avena sativa.</i> Linn. <i>Graminea.</i>	Not specially fertile. Clay loam preferable.	April-May north. February-March, September-December south.	2-3 bushels.	30.1 bushels.	Probable nativity Tartary in western Asia, or possibly eastern Europe. Largely north temperate zone crop, but grown in Australia, Africa and South America. Has been cultivated in America since advent of first settlers.	Food for animals. Human food. Forage crop. Pasture.
<b>Rice.</b> <i>Oryza sativa.</i> Linn. <i>Graminea.</i>	Rich, moist, well-drained clay loam.	March 15-June 15.	1.3 bushels	25-30 bushels.	Existed in India in early historic times, and doubtless indigenous there. Introduced into America soon after settlement of Virginia. Introduced accidentally into lower Carolina in 1694.	Human food. Stock feed. Wine.

\*The bulletins herewith mentioned may be had upon application to the director of the respective agricultural experiment station or college publishing

CULTURE AND ANIMAL HUSBANDRY  
FIELD CROPS

FERTILISERS	PLANT DISEASES AND ENEMIES	REMEDIES	BULLETINS*
Line to correct acidity, well-rotted manure. Commercial fertilizer containing phosphoric acid and potash.	Dodder. Leaf spot. Anthracnose. Root rot. Web-worm, army worm.	Close cutting, removal of stalks, burning, close pasturing. Mowing. Watering and application of nitrate fertilizer. Plowing under. Mowing, fall disking.	Farmers' Bulletin Nos. 194, 215, 330, 373. Canada Central Experimental Farm Bulletin No. 46. Most experiment stations have issued bulletins.
Barnyard manure. 500 to 1,000 pounds of complete commercial fertilizer.	Rust and mildew. Closed smut.  Loose smut.	No effective remedy. Formaldehyde treatment: 1 pint formaldehyde into 20 gallons water in barrel. Submerge sacks of barley 10 minutes in solution, then empty on platform to dry. Preferably, cover drying seeds with blanket for two hours. Hot water treatment, which is effective also against closed smut: Grains in gunny sacks submerged 12 hours in cold water, to soften hull; then removed and drained 1 hour; then submerged in hot water at constant temperature of 130° F. for not over 6 minutes. Seed should be sown same or following day.	Wisconsin Experimental Station Reports Nos. 20, 21, 22, 23.  Year books of the U. S. Dept. Agr.
Fertilizer seldom needed. Light applications barnyard manure or moderate dressing of complete fertilizer on poor soil. 100 pounds of low-grade fertilizers, especially if sown late.  Crushed and unburned lime-stone. Carbonate of lime. Stable manures.	Relatively free from diseases and insects. Birds may cause loss.		Yearbooks of the U. S. Dept. Agr.  Cornell Bulletin No. 238.
See alsike clover.	Clover sickness, a soil condition, the result of overcropping to clover. Flower midges.  Seed fly. Root borer. See alsike clover.	Grow clover less frequently in the rotation. The addition of potash may aid.  Feed off or mow first crop just before timothy heads out. Pasturing or clipping back to delay blooming ten days useful. No practicable remedy known. Crop rotation. See alsike clover.	U. S. Dept. Agr. Plant Industry Bulletin Nos. 31, 59, 66, 123.  Farmers' Bulletin Nos. 123, 237, 260, 323.  See alsike clover.
See alsike clover.	See alsike clover.	[See alsike clover.	See alsike clover.
10-20 tons farm manure each year or two. Phosphoric acid, nitrogen and potash. Plow under large quantities of vegetable matter, preferably legumes and grasses.  Add phosphate kainit. Muriate of potash. Nitrate of soda. Cottonseed meal. Barnyard manure.	Root worm. Webworm. Cutworm.  Chinch bug. Grasshoppers. Crows. Smut. Webworm and cotton-square borer. Plant lice.  Cutworms. Cotton worm.  Cottonboll worm. Mexican cottonboll weevil. Wilt. Screw-worm or damping off. Root knot.	Crop rotation and fall plowing. Crop rotation and fall plowing. Early fall plowing. Sprinkling bran mixed with paris green and molasses in proportions of 30 pounds bran, 1 pound paris green, 2 quarts molasses, enough water to moisten the bran. Trap in dusty furrows. Destroy in furrows by kerosene. Strip of coal tar will prevent passage. Trap on wide catches drawn rapidly around field. Burn affected plants and rotate crops. Dust with paris green.  Plow under host plants in fall or winter, or spray with whaleoil soap, kerosene emulsion or tobacco solution. Haul about fields bunches of grass immersed in paris green; or destroy by winter cultivation. Apply paris green to plants. Mature crop early and destroy immediately all rubbish. Fumigate seed with carbon bisulphide before planting. Plant disease-resistant seed; burn infested plants; rotate crops. Lime and cultivate to keep surface much dry.  Bordeaux mixture. Iron variety practically immune.	U. S. Dept. Agr. Office of Experimental Station Bulletin No. 57. Farmers' Bulletin Nos. 32, 41, 81, 174, 199, 229, 253, 292, 298, 308, 312, 317.  U. S. Dept. Agr. Office of Experimental Station Bulletin No. 33. Bureau Plant Industry Bulletin No. 62. Division of Statistics Bulletin No. 16. Yearbooks 1902, 1904. Farmers' Bulletin Nos. 36, 48, 217, 302, 314, 326.  U. S. Dept. Agr. Bureau of Plant Industry Bulletin No. 25. U. S. Dept. Agr. Agronomy Bulletin No. 64, Circular No. 24. Yearbook for 1906. Most experiment stations have issued bulletins. New York (Cornell) Bulletin No. 243, 244.
Phosphoric acid 200 to 400 pounds and muriate of potash or kainit, 100 pounds per acre.	Wilt.		
10 to 12 tons manure in fall. 100 to 200 pounds muriate of potash in fall or early spring.	Mildew and leaf spot. Nematode worms.  See sugar beet.	Seldom extensive damage. Iron variety practically immune.  See sugar beet.	
Manure to be determined by local needs. Requires plant food near surface.	Smut.	Formaldehyde or hot water treatments. See under barley.	Farmers' Bulletin No. 168. Division of Botany Bulletin No. 23. Kentucky Experiment Station Bulletin No. 98. Kansas Bulletin No. 162.
Fertilizers must be used sparingly. Barnyard manure, 10 to 25 loads per acre on poor soils. Fertilizer containing 10 to 20 pounds each of ammonia and potash, and 30 to 60 pounds of phosphoric acid.  Rich soils generally used.	Chinch bug.  Closed and loose smut.  Orange leaf rust. Black stem rust. Chinch bugs. Army worms.	Crop rotation. See under oats.  Formaldehyde or hot water treatments of seed. See under barley.  Plant resistant and early maturing varieties.  Plow furrow to prevent spread. Scatter tar in furrow. In extreme cases burn one field to save another.	Farmers' Bulletin Nos. 250, 393, 420, 444. Ohio Experiment Station Bulletin No. 101, 108. Louisiana Experiment Station Bulletin No. 24, 50, 61, 77.
	Rice weevil. Rice worm. Rice grub. Chinch bug. White blight. Smut.	Carbon bisulphide. Draw off water and allow field to dry for few days. Water. Thorough flooding. Application of lime to soil. See under barley.	Farmers' Bulletin No. 110. Division of Botany Bulletin No. 22. U. S. Dept. Agr. Office of Experiment Station Bulletin No. 112. Louisiana Experiment Station Bulletin No. 24, 50, 61, 77.

the same, or to the United States Department of Agriculture. A list on each station follows the table.

TABLE I. FIELD

CROP	SOIL	PLANTING DATA	SEED TO ACRE	AVERAGE YIELD PER ACRE	ORIGIN AND BRIEF HISTORY	USE
<b>Rye.</b> <i>Secale cereale.</i> Linn. Gramineae.	Light, with little clay. Well drained, will grow on poor soil.	April-May or September-November.	3-4 pecks early, 6-8 pecks late.	15.7 bushels. 1 ton of straw.	Original home was between Austrian Alps and Caspian Sea. Culture more than 2,000 years old. Seems to be of decreasing importance.	Grain for animal and human food. Fall pasture. Cover-crop and green manure. Alcoholic liquors. Pasture for hogs. Hay. Fodder. Silage. Straw.
<b>Sorghum.</b> <i>Andropogon sorghum.</i> Linn. or <i>Sorghum vulgare.</i> Pers. Gramineae.	Rich, well drained, sandy or clay loam.	March-June.	1.5 to 2 bushels broadcast, 6 pounds to 0.5 bushel for silage drilled.	3-6 tons fodder, 8-20 tons green forage.	Originated in tropical or subtropical regions of old world, and in cultivation as human food for many centuries, long before Christian era. Tropical Africa generally considered birthplace.	Flour. Alcoholic liquors. Pasture for hogs. Hay. Fodder. Silage. Straw.
<b>Soybean.</b> <i>Glycine hispida.</i> Maxim. Leguminosae.	Well-drained sandy, loam or clay soil.	May-June.	2-3 pecks in drills, 1 to 1.5 bushels broadcast.	12-20 bushels.	Native of southeastern Asia. Thought to be derived from wild <i>Glycine soja</i> of Japan. Grown extensively in China and Japan.	Animal grain feed. Silage. Soybean oil. Hay. Cover-crop and soil improvement. Human food.
<b>Sugar Beet.</b> <i>Beta vulgaris.</i> Mout. Chenopodiaceae.	Clay loam, or not too light sandy loam.	May, north January-May south.	15-20 pounds.	11.5 tons.	Known at least three centuries before Christian era. Sugar first extracted about middle of eighteenth century by Margraff. First attempt to grow beets for sugar in U. S. in 1830, near Philadelphia.	Stock feeding. Sugar manufacture.
<b>Sugar Cane.</b> <i>Saccharum officinarum.</i> Linn. Gramineae.	Well-drained soil of good average character.	March 21-May 20.	4 tons of cane.	8-25 tons.	Origin lost in antiquity. Cultivation probably among first undertaken by tropical peoples. Early use almost exclusively for eating raw. As source of sugar it stood practically alone until beginning of last century.	Manufacture of sugar and molasses.
<b>Sweet Potato.</b> <i>Ipomoea batatas.</i> Poir. Convolvulaceae.	Warm, sandy, well-drained and aerated.	March 21-May.	1.5 to 4 bushels.	100 bushels.	Native unknown, probably tropical America. Was cultivated in tropics of both hemispheres when authentic records began. De Candolle inclines to an American origin.	Human food.
<b>Timothy.</b> <i>Phleum pratense.</i> Linn. Gramineae.	Deep, clay loam, moist and fertile.	March-October.	8-16 pounds; with clover 10 pounds.	1.5 tons.	Native of Europe and extensively cultivated in cooler parts of North America as a forage plant. Introduced to America from England in 1720.	Hay. Pasture.
<b>Tobacco.</b> <i>Nicotiana glauca.</i> Linn. Solanaceae.	Rich, friable sandy loam in seed-bed, well fertilized each spring with fertilizer containing 10 per cent ammonia, 8 per cent available phosphoric acid, 12 per cent soluble potash.	February 1 to March 1 in seed-bed, April-June in field.	1 table-spoonful to 100 square yards of seed-bed, to set out six acres.	800-1000 pounds.	Of American origin. Pipes and other means for smoking tobacco were found in prehistoric mounds of the United States, Mexico and Peru. Columbus found natives using tobacco for smoking, chewing and snuff. In 1558, Jean Nicot, French ambassador to Portugal, sent a supply of tobacco seed to Queen Catherine de' Medici, and to commemorate the service the generic name Nicotiana was given.	Disinfectant. Smoking and chewing purposes. Stalks for making of paper.
<b>Vetch.</b> <i>Vicia spp.</i> Leguminosae.	Wide range. Used on poor sandy or gravelly soils to improve them. Prefers moist clay loam.	April-June, September-December.	1 bushel.	1.5 to 3 tons.	Common spring vetch is native in Europe and western Asia. Was cultivated by Romans. Reached America 100 years ago.	Cover-crop. Stock feed. Soil improvement. Pasture.
<b>Wheat.</b> <i>Triticum sativum.</i> Lam. Gramineae.	Light clay and glacial drift soil.	September-October, April-May.	6-8 pecks.	13.8 bushels.	Wheat cultivation antedates recorded history. Monuments more ancient than Hebrew scriptures depict its cultivation established. Chinese grew wheat 2700 B. C. Cultivation in America prior to discovery by Columbus not known.	Flour for human food. Grain for stock feeding. Straw. Bran, shorts and middlings are by-products for stock-feeding.

TABLE II. ORCHARD

CROP	CLIMATE	SOIL	PLANTING TIME, PLANTS OF SEED PER ACRE	DISEASES	REMEDIES
<b>Apple.</b> <i>Pyrus malus.</i> Linn. Rosaceae	Temperate	Clay loam to sandy loam, with variety preferences.	Fall or spring, fall preferable.—27-33.	Scab.  Fire blight.  N. Y. apple tree canker.	Spray thoroughly with lime-sulphur, 1-40, or bordeaux, 3-3-50, 3 times: (1) Just before blossoms open, (2) just as blossoms fall, (3) 10 to 14 days after blossoms fall. Cut out and destroy diseased parts. Wash wound with corrosive sublimate 1 part to 1,000 of water. Paint wound with gas tar or lead paint. Spray before buds start with lime-sulphur, 1-12, or bordeaux, 10-10-50; soak body and limbs when making first application for scab. Cut out cankers and treat wound as for fire-blight.
<b>Asparagus.</b> <i>Asparagus officinalis.</i> Linn. Liliaceae	Temperate.	Warm, well-drained loam, deep rich, fertile and moist.	Early spring, April preferable for seed.—5,445-14,520. 1 os. of seed to 400 plants. Rows 3 ft. apart, plants 1 ft. in row; or rows 4 ft. apart, plants 2 ft. in row, 5,445. Rows 2 ft. apart, plants 15 inches in row, 14,520.	Rust.	During cutting season, permit no plants to mature. Fertilize liberally and cultivate thoroughly. Late in the fall burn all infected plants. Spray with bordeaux, 5-5-50, containing a tickler of resin, red soda, soap. Spray when shoots are 8 to 10 inches high after cutting, and repeat once or twice a week.

## CROPS—Continued

FERTILIZERS	PLANT DISEASES AND ENEMIES	REMEDIES	BULLETINS
350 pounds per acre of dissolved phosphate rock.	Black rust of stems. Orange rust of leaves. Smut. Ergot. Chinch bug. Hessian fly.	Burn infested stubble—rotate crops. Formaldehyde or hot water treatment. See under barley. Clean seed on clean land. Burn rubbish nearby. Rotate crops. Plow deep trenches and use tar strips. Resistant varieties, late seeding, burning stubble, sowing early wheat trap crop.	Pennsylvania Agr. Experiment Sta. Bulletin No. 52. U. S. Dept. Agr. Yearbooks.
Barleyard manure and leguminous fertilizers.	Grain smut. Whole-head smut. Chinch bugs and green aphids.	Rotation and seed selection. Hot water and formaldehyde treatments. See under barley. Seldom serious. Avoid continuous cropping on same area.	Farmers' Bulletin No. 37, 50, 90, 135, 174, 246, 288. Bureau of Chemistry Bulletin No. 14, 20, 26, 34.
200 to 300 pounds high-grade acid phosphate, 50 pounds muriate or sulphate of potash per acre.	Sclerotium. Nematode root worms. Rabbies. Grasshoppers. Reddish brown hairy caterpillar.	Fatal. No treatment. Not specially serious.	Farmers' Bulletin No. 58, 121, 372. Connecticut Experiment Station Bulletin No. 22. Delaware Bulletin No. 60, 61. Georgia Bulletin No. 17. Indiana Bulletin No. 108. Kansas Bulletin No. 16, 92, 100, 123. Many other station bulletins. Division of Entomology Bulletin No. 19, 23, 29, 31, 40, 43. Special Report No. 28. Bureau of Chemistry Bulletin No. 27, 96.
Green fertilizers, generally alfalfa. Stable manures. Complete commercial fertilizers.	Leaf spot. Curly top. About 160 insect enemies.	Bordeaux mixture and crop rotation. Seldom occurs in two successive seasons in same locality. See entomology bulletins in next column.	Farmers' Bulletin No. 52, 92. Bulletin of Hawaiian Sugar Planters Experiment Station, Louisiana, Cuba, and Porto Rico Experiment Stations.
Stable manure. Nitrogenous fertilizers, dried blood, fish refuse in small quantities. Lime extensively.	Root diseases, rind diseases, scorch, pineapple disease, red top, top rot, smut, rust. Mites. Borers. Innumerable insects. Parasitic nematodes on roots.	Burn over, use quicklime as soil fungicide. Plant in new soil. Burn over or poison. Mongongo will destroy. Hand pick, rotate crops, use trap crops, or rest land. Fought by introduction of parasites. Expose soil to air and sunlight.	Farmers' Bulletin No. 26, 129, 324. Arkansas Experiment Station Bulletin No. 72. South Carolina Bulletin No. 63.
Abundant humus. Light straw manure. Crimson clover and plowed under at half-growth. Stable manure put in furrow under the crop.	Black rot. Soft rot. Soft rot. Tortoise beetles. Sawflies. Flea beetles.	Use slip-seed. Thoroughly clean and disinfect storage house. Dry potatoes before storing. Destroy all infected potatoes. Crop rotation. Apply kainit and sulphur, 300 pounds per acre. Dry potatoes before storing. Destroy all infected potatoes. Dip plants before setting in solution of arsenate of lead, 1 pound to 25 gallons water. Paris green or the above arsenical spray. Arsenical sprays.	Farmers' Bulletin No. 111. Division of Agronomy, U. S. Dept. Agr., Bulletin No. 7, 14, 17, 20. N. Y. State College of Agr. Farmers' Reading-Course Bulletin No. 10.
Top dressing with barnyard manure and complete fertilizer.	Root rot. Sore skin. Wilt. Angular leaf spot. Folk burn. Flea beetle and horn-worm. Tobacco worm. Cutworms.	Sterilize soil with hot or formalin before seed sown. Lime. Plant disease-resistant seed; burn infested plants; crop rotation. Grow vigorous plants. Apply heat carefully and ventilate sheds to reduce humidity. Light spray of paris green, 1 pound paris green, 1 pound quicklime, 100 gallons water, stirred constantly while in use. Dust or spray with paris green, 1 pound to 160 gallons water. Sow along rows bran and paris green, 1 pound paris green, 50 pounds bran. Hand pick or dust or spray with paris green.	Farmers' Bulletin No. 60, 82, 83, 120, 343. Plant Industry Bulletin No. 18, 51, 91, 96. Report on the Culture of Tobacco, U. S. Census, 1883. Bulletins from experiment stations, particularly Connecticut, Maryland, North Carolina, Kentucky.
Seldom needed. On poor land, complete fertilizer, and especially phosphoric acid and potash, may be required.	Bud worm.		Farmers' Bulletin No. 18, 102, 147. Division of Agronomy Circular No. 6. Alabama Experiment Station Bulletin No. 87, 96, 105.
Barnyard manure. Complete commercial fertilizers. 200 to 400 pounds of a 4-12-4 fertilizer commonly used.	Hessian fly. Chinch bug. Rust. Loose smut. Stinking smut or bunt.	Late seeding, burning stubble. Clean tillage, crop rotation. Plant resistant varieties. No satisfactory treatment. Formalin, 1 pound to 50 gallons water. Sprinkle the wheat and cover with cloths soaked in the solution, or immerse the seeds 30 minutes; or blue stone, 1 pound to 5 gallons water. Immerse seeds 10 minutes, then drain and dry. Apply the solution to all utensils and machinery used.	Farmers' Bulletin No. 132, 250. U. S. Dept. Agr. Division of Physiology and Pathology No. 16, 24, 29. Plant Industry Bulletin No. 3, 47, 78, 79. Office of Experiment Station Bulletin No. 11.

## AND GARDEN CROPS

INSECT AND OTHER ENEMIES	INSECTICIDES AND REMEDIES	TIME TO BEAR	YIELD PER ACRE	BULLETINS ON CULTURE
Bud moth.	Applications of either 1 lb. paris green or 4 lbs. arsenate of lead in 100 gals. water (1) when leaf tips appear and (2) just before blossoms open.	3 to 6 years from planting. Good crop in 10 to 15 years.	Tree 30 years old 20-30 bus.	Cornell Bul. 272. California Buls. 103 and 185. Cornell Buls. 93, 124, 142. Geneva Buls. 262, 206, 306, 330. Geneva Circular 9.
Canker worms.	Spray once or twice before blossoms open with 1 lb. paris green, or 4 lbs. arsenate of lead in 100 gals. water. Keep after blossoms fall. Use sticky bands or wire-screen traps to prevent ascent of wingless females. Use burdock bags on trunk, and kill caterpillars under them every 10 days from July 1 to Aug. 1, and once later.			
Codling moth.	Spray with kerosene emulsion diluted with 6 parts of water or whale oil soap, 1 lb. to 4 or 6 gals. water, in May or June when young white leaf appear.			
Oyster shell scale.	Chickens and ducks will destroy. Close cutting of young shoots early in season. Use fresh air-slaked lime or arsenites dusted on dew-wet plants after cutting period.	Seed 3-4 years. Plants 1-3 years.	2000 bunches of 3½ in. diameter.	Geneva Buls. 75, 188. California Buls. 105 and 172. New Jersey Reports 1895, 1896. Farmers' Bul. 61. Massachusetts Bul. 61. Iowa Bul. 63.

TABLE II. ORCHARD AND

CROP	CLIMATE	SOIL	PLANTING TIME, PLANTS OR SEED PER ACRE	DISEASES	REMEDIES
<b>Beans</b> (bush), <i>Phaseolus vulgaris</i> , <i>Leguminosae</i>	Warm temperate.	Good warm loam.	May-June—1 qt. of seed to 100 feet of drill. In drills 2 ft. apart plants 15 inches in row, in hills, 18x20 inches, 1 plant per hill. Should be 3 plants per hill.	Anthraxnose or red spot.	Plant clean seed. Hand spray with Bordeaux mixture, 5-5-50, (1) when plants break through ground, (2) when first pair of leaves are expanded, (3) when pods have set.
<b>Beans</b> (pole), <i>Phaseolus vulgaris</i> , <i>Leguminosae</i>	Warm temperate.	Warm fertile soil.	Late spring, after danger of frost. After ground becomes warm—1 qt. seed to 200 hills. Hills 4x4 ft., one plant per hill. Should be at least 5 plants per pole.	Blight.	Spray with bordeaux as for anthraxnose.
<b>Beets</b> , <i>Beta vulgaris</i> , Linn., <i>Chenopodiaceae</i>	Temperate.	Loose, light, fresh, clean rich soil.	April-June—Seed 5-6 lbs. per acre. In drills 12x6 inches.	Scab, rust, rot, spot diseases.	Avoid following potatoes with beets. Practice clean culture and proper rotation. Spray with bordeaux mixture for leaf diseases.
<b>Blackberry</b> , <i>Rubus nigro-obscurus</i> , Bailey, <i>Rosaceae</i>	North temperate. Cool, northern exposure.	Strong loam, retentive of moisture and tending toward clay.	Spring preferably, or fall—900 to 1550.	Anthraxnose and leaf rust.	Cut out bearing canes as soon as they are through fruiting.
<b>Cabbage</b> , <i>Brassica oleracea</i> , Linn., <i>Cruciferae</i>	Cool, moist climate.	Well drained, rich, friable loam.	April-May to June-July—7,000-11,000. 1 oz. seed to 3,500 plants.	Club-root or club foot.	Practice crop rotation. Set only healthy plants. Do not use manure containing cabbage refuse. Lute the seed-bed at least as early as fall before.
<b>Cauliflower</b> , <i>Brassica oleracea</i> , Linn., var. <i>botrytis</i> , D. C., <i>Cruciferae</i>	Temperate, cool and moist.	Richest land, strong, moist, loam best.	April-May in seed-bed. July in field.—7,000 to 10,000. 1 oz. seed to 3,000 plants.	Black rot.	Practice crop rotation. Soak seed 15 minutes in solution made by dissolving one corrosive sublimate in 100 parts of water.
<b>Celery</b> , <i>Apium graveolens</i> , Linn., <i>Umbelliferae</i>	Temperate.	Moist peaty soil or highly fertilized land.	January-April in seed-bed. May-August in field—20,000 to 30,000. 1 oz. seed to 7,000 plants.	Same as cabbage.	See cabbage.
<b>Cherry</b> , <i>Prunus avium</i> and <i>Prunus cerasus</i> , Linn., <i>Rosaceae</i>	Secret, 35-45° latitude, 60-80° longitude. Sour, 35-45° latitude, 68-100° longitude.	Elevated, light, dry, loamy, retentive soil.	Spring or fall—Sweet 48, sour 154.	Cercospora leaf blight of early blight. Septoria leaf blight or late blight.	Spray with ammoniacal copper carbonate, 6-3-45, making 5 to 8 applications. Begin while still in seed-bed. Bordeaux 5-5-50, may be used for earlier application.
<b>Current</b> , <i>Ribes rubrum</i> , Linn., <i>Saxifragaceae</i>	Cool temperate climate.	Cool, moist and rich soil.	Fall or spring—2,178.	Black knot. Leaf spot; powdery mildew.	Plant resistant varieties. Prune trees to let in sunlight and air. Spray with well-leaked lime-sulphur, 5-5-50, to which add 2 lbs. arsenate of lead to 50 gals. Spray (1) about time young fruit sets, (2) 2 to 3 weeks later, (3) 1 month before fruit ripens, omitting the arsenate.
<b>Cowberry</b> , <i>Ribes ssp.</i> , <i>Saxifragaceae</i>	Cool and shady north temperate.	Moist, but not soggy, clay loam. Herb, root, bottom lands.	Fall or early spring—2,178.	Black knot. Leaf spot; powdery mildew.	Cut out and burn all knots before leaves appear. Spray with lime-sulphur or bordeaux. Dust with sulphur or spray with potassium sulphide, 1 oz. to 3 gals. water, or lime-sulphur as for leaf spot.
<b>Grape</b> , <i>Vitis ssp.</i> , 1 <i>Rosaceae</i> .	Warm. Along shores of water best. The location must provide frost drainage.	Gravelly or clay.	In spring. Completed by last of May—605.	Black rot.	Begin when plants are small, on over 3 or 4 times every summer and cut out and burn all diseased canes. Upon first appearance of current worms spray with bordeaux and Paris green, 1 lb. to 100 gals., or arsenate of lead, 4 lbs. to 100 gals. Repeat if second brood of worms appears.
<b>Lettuces</b> , <i>Lactuca sativa</i> , Linn., <i>Compositae</i>	Cool temperate.	Open, loose, rich loam.	April-June Aug-Sept.—1 oz. seed to 3,000 plants. Rows 2 ft. apart, plants 1 ft. in row equals 2,780 plants.	Downy mildew.	Cut away drooping branches. Keep ground free from weeds. Spray with potassium sulphide, 1 oz. to 2 gals. Commence when buds are breaking and repeat every 7 to 10 days until fruit is gathered.
<b>Muskmelon</b> , <i>Cucumis melo</i> , Linn., <i>Cucurbitaceae</i>	Hot, bright temperate climate.	Light and quick warm soil. Sandy loam.	May-June—1 oz. seed to 50 hills. Plants 6x6 ft. (preferable). Plants 5x3 ft.	Black rot.	Remove all mummies and diseased leaves. Rake all refuse into burrows and cover. Use surface cultivation and keep down weeds and grass. Keep vines well sprouted. Spray with bordeaux, 4-4-50, till middle of July, after that with ammoniacal copper carbonate. Spray first when third leaf shows. Foliage should be protected by shading of spray before early rain. Make 4 applications of bordeaux, 50 to 60 gals. of spray to acre. Apply bordeaux as for black rot.
<b>Onion</b> , <i>Allium cepa</i> , Linn., <i>Liliaceae</i>	Temperate.	A rich, moist, but not wet, loam with subsoil of clay.	April-May—1 oz. to 100 feet of drill. 4-5 lbs. per acre. In drills, 14 to 20 in. apart, seed 5 to 6 lbs.; sets 6 to 12 lbs.	Downy mildew. Wit.	Steam sterilization of soil to depth of 2 inches or more; or use fresh soil for every crop. Common in greenhouses.
<b>Pea</b> (garden), <i>Pisum sativum</i> , Linn., <i>Leguminosae</i>	Temperate.	Rich, friable soil, but overrich in nitrogen.	April-May or July-Aug.—1 quart of seed to 100 ft. of drill, or 2 lbs. per acre. Dwarf 12x1 in.; tall, double rows 3 ft. apart.	Mildew. Smut.	No effective method of control. Crop rotation. Drill into rows when planting seed, 100 lbs. sulphur and 50 lbs. air-slacked lime to acre.
				Powdery mildew.	Fungal spray.

## GARDEN CROPS—Continued

INSECT AND OTHER ENEMIES	INSECTICIDES AND REMEDIES	TIME TO BEAR	YIELD PER ACRE	BULLETIN ON CULTURE
Worm.	Use bisulphide of carbon as for pea bug.	45-65 days from seed.	75-120 bus.	Cornell Bul. 239. New Jersey Bul. 161. Geneva Bul. 48.
Worm.	Use bisulphide of carbon as for pea bug.	65-70 days from seed.	75-100 bus. dry beans.	Cornell Buls. 87, 118. New Hampshire Bul. 62.
Not often damaged by insects.		65-150 days.	400 to 700 bus.	Cornell Bul. 168.
Saw-fly. Cane borer.	Spray with paris green or arsenate of lead, or apply hellebore. In midsummer cut off and destroy the drooping tips.	1 year. Good crops in 2 and 3 years.	50 to 100 bus.	Cornell Bul. 99. Central Experimental Farm. Ottawa, Can., Bul. 86.
Cabbage worm.	If plants not heading, spray with kerosene emulsion or paris green to which sticker has been added. If heading, apply hellebore.	90-180 days.	7500 heads.	New Jersey Bul. 98. Geneva Buls. 232, 251, 302. Cornell Bul. 78.
Cabbage aphid.	Before plants begin to head spray with kerosene emulsion diluted with 6 parts water; whale-oil soap, 1 lb. in 6 gals. water; or one of tobacco extracts.	110 days from seed.	125-200 barrels, 18-30 heads per barrel.	See cabbage.
Same as cabbage.	See cabbage.			
No widespread or serious insect pests.		120-180 days.	120-160 crates.	Cornell Bul. 132. Michigan Bul. 102. Geneva Bul. 81.
Aphid.	Spray with kerosene emulsion diluted with 6 parts of water or with one of tobacco extracts.	3 years. Commercial crops 4-6 years according to variety.	2½ tons.	Cornell Buls. 81, 98, 238. Geneva Bul. 98. U. S. Dept. Agr. Bureau of Entomology Circular 120.
Plum curculio.	Spray just after blossoms fall with arsenate of lead, 6-8 lbs. in 100 gals. water, and repeat in about a week. After fruit has set, jar trees daily over sheet or curculio catcher.			
Curran worm.	When worms first appear, spray with 1 lb. paris green or 4 lbs. arsenate of lead in 100 gals. of water. Ordinarily the poison should be combined with bordeaux. After fruit is half grown use hellebore.	1 year. Good crops in 2 and 3 years.	100 bus.	Geneva Buls. 167, 169. Iowa Bul. 80.
Curran worm.	See curran.	1 year. Good crops in 2 and 3 years.	100 bus.	Geneva Buls. 114, 133, 161.
Steel beetle or flea beetle.	When buds begin to swell, cover with arsenate of lead, 8 lbs. in 100 gals. of water. To kill larvae add 1 lb. paris green or 4 lbs. arsenate of lead to every 100 gals. of bordeaux mixture.	Fair crop in 4 years.	3 to 5 tons.	Cornell Buls. 157, 208, 224, 238, 254, 266.
Root worm.	Spray latter part of June with 6 lbs. arsenate of lead in 100 gals. water. Repeat in 7 to 10 days. Cultivate thoroughly in June, close to vines, to kill pupae.			
Leaf hopper.	Spray underside of leaves with whale-oil soap, 1 lb. in 10 gals. water, about July 1. Repeat in a week or 10 days.			
Rose chaffer. Little troubled by insects.	Spray with 10 lbs. arsenate of lead in 100 gals. water.	65 days from seed.	400-800 half-bushel baskets. 600 baskets good average.	Massachusetts Bul. 99.
Striped cucumber beetle.	Plant early squashes as trap crop. Spray with bordeaux. Dust with tobacco dust or snuff, or laid plaster with a little kerosene or turpentine.	120-140 days from seed.	3,000-7,000 melons.	Cornell Bul. 95.
Aphid.	Spray with kerosene emulsion diluted with 6 parts water or use one of tobacco extracts. Burn vines after harvest, and keep down weeds.	135-150 days from seed.	500 bus.	Geneva Bul. 192. Michigan Bul. 51.
Onion fly or maggot. Thrips.	See cabbage-root maggot. Kerosene emulsion, diluted with 6 parts water; tobacco decoction; whale-oil soap, 1 lb. to 4 gals. water.			
Pea weevil or pea bug.	Fumigate seed stock with carbon bisulphide. Place seed in tight vessel or room and expose to fumes for 2 or 3 days. One pound of bisulphide for 100 bushels of peas.	50 to 80 days.	100 to 150 bus. green in pod.	Cornell Bul. 67. Farmers' Bul. 48. Florida Bul. 36. New Jersey Report 14. Delaware Bul. 49.
Pea moth or worm.	Early planting of early varieties.			
Pea aphid or louse.	Plant seed in drills and use cultivator to bury aphides after they have been brushed from vines.			

TABLE II. ORCHARD AND

CROP	CLIMATE	SOIL	PLANTING TIME. PLANTS ON SEED PER ACRE	DISEASES	REMARKS
<b>Peach.</b> <i>Prunus</i> <i>serotina</i> . Sieb. & Zucc. <i>Rosacea</i> .	Warm and sunny. In north near body of water.	Light and sandy loam.	Spring preferable—134.	The yellow. Leaf curl. Brown rot.	Dig out and burn diseased trees as soon as discovered. Spray trees once before buds swell with bordeaux, 5-5-50, or lime-sulphur mixtures used for San Jose scale. Plant resistant varieties. Prune trees to let in air and sunlight. Thin fruit well. Spray with self-boiled lime-sulphur, 8-8-50, and arsenate of lead 2 lbs. to 50 gals. water. Spray (1) when shuck is abedding from young fruit, (2) 2 to 3 weeks later, (3) 1 month before fruit ripens, omitting the arsenate.
<b>Pear.</b> <i>Pyrus</i> <i>communis</i> . Linn. <i>Rosacea</i> .	Temperate. Best near large bodies of water.	Strong loam of moderate depth overlying a porous subsoil.	Spring or fall—48 to 108 standard plants. 193 dwarf plants.	Fire blight. Scab.	Prune out blighted branches, cutting 6 to 8 inches below diseased part. Disinfect with corrosive sublimate solution, 1 to 1,000. Clean out limb and body cankers. Disinfect all large wounds and cover with coat of paint or gas tar. Plant resistant varieties. Spray three times with lime-sulphur, 1-50, or bordeaux, 3-3-50, as for apple scab.
<b>Plum.</b> <i>Prunus</i> <i>domestica</i> . Linn. <i>Rosacea</i> .	Temperate.	Clay loam. Some varieties on light moist soils.	Spring or fall—108-134.	Black knot. Brown rot. Leaf spot.	Cut out and burn all knots before leaves appear in spring. See peach. Two or three applications of self-boiled lime-sulphur or bordeaux, 3-3-50. First application about 10 days after blossoms fall. Japan plums should not be sprayed with bordeaux. Spray with bordeaux, 5-5-50. Commence when plants are 8 to 8 in. high and repeat every 10 to 14 days during season. Use 40 to 100 gals. per acre each application.
<b>Potato.</b> <i>Solanum</i> <i>tuberosum</i> . Linn. <i>Solanaceae</i> .	Moist, cloudy climate. Sensitive to frost.	Warm, rich, sandy or loamy soil.	March to May—8 to 10 bu. seed. Early, rows 18 in. apart; late, 3 ft. x 18 in. or 3 ft. x 3 ft.	Blight and rot. Scab.	Treat tubers before cutting by soaking in formalin solution, 1 pint to 30 gals. water, for 2 hours, or in corrosive sublimate, 1 oz. to 7 gals. for 1½ hours. Plant in clean soil. Spray three times with bordeaux as for apple and pear scab.
<b>Quince.</b> <i>Cydonia</i> <i>cydonia</i> . Pers. <i>Rosacea</i> .	Temperate.	Heavy, moist, retentive clay loam, well drained.	Spring or fall—200.	Leaf and fruit spot.	
<b>Radiish.</b> <i>Raphanus</i> <i>sativus</i> . Linn.	North temperate.	Rich, light, loose; one that drains rapidly.	March-Sept.—1 oz. seed to 100 ft. of drill. Rows in garden, 12 to 18 in. apart.	Relatively free from diseases.	
<b>Raspberr.</b> <i>Rubus</i> <i>strigosus</i> . Michx. (red). <i>R. occidentalis</i> . Linn. (black).	Cool temperate.	Deep, moist soil. Lighter loams for red, heavier loams for black.	Fall or spring, the latter preferable for black caps—Black 2,420; red 2,904.	Anthracnose.	Remove all old canes and diseased new ones as soon as fruit is gathered. Spray with bordeaux, 5-5-50, when new canes are 6 to 8 inches high and follow with two more at intervals of 10 to 14 days. No successful treatment known. For new settings use only plants from healthy plantations. Dig up and destroy infected plants.
<b>Spinach.</b> <i>Spinacia</i> <i>oleracea</i> . Linn. <i>Chenopodiaceae</i> .	Cool season plant. Grown in fall and spring.	Abundance of available plant-food, particularly nitrogen. Any good garden or field soil.	March and Aug.-Sept.—1 oz. seed to 100 ft. of drill or 10 to 12 lbs. per acre; rows 12 to 15 in. apart.	Cane blight or wilt. Red rust. Mildew, anthracnose, leaf blight.	Burn all affected parts. Practice crop rotation. Treat soil with mixture of flowers of sulphur and air-slacked lime.
<b>Squash.</b> <i>Cucurbita</i> <i>pepo</i> , var. <i>Cucurbita</i> . Linn.	Temperate.	Warm and quick soil. Sandy, var. Cucurbita. Sandy or sandy loams best.	Summer, April-May; winter, May-June 1 oz. seed for 25 hills, or 4 lbs. per acre. Summer, hills 4x4 ft.; winter, hills 8x10 ft.	Mildews.	Bordeaux mixture or ammoniacal carbonate of copper.
<b>Strawberry.</b> <i>Fragaria</i> <i>chiloensis</i> , var. <i>androsaema</i> .	Cool season plant.	Rich, rather moist, sandy soil.	Aug. or spring—10,000 to 14,000.	Leaf-spot, rust, or leaf-blight.	In setting new plantations, remove all diseased leaves before plants are taken to field. Spray newly set plants with bordeaux, 5-5-50, as soon as growth begins. Repeat three or four times during season. The following spring, spray just before blossoming and again 10 to 14 days later. Plant resistant varieties.
<b>Tomato.</b> <i>Lycopersicon</i> <i>esculentum</i> , var. <i>esculentum</i> , var. <i>esculentum</i> .	Warm climate, long season, sunny, open position.	Warm soil, light, porous and well drained.	Start plants in hot bed Feb. or March; transplant May to June—1 oz. to 3,000 plants.	Septoria, leaf-spot. Mildew. Black rot. Bacterial blight. Club rot. Bolt rot.	Spray with bordeaux, 5-5-50, as soon as plants are set out. Spray underside of leaves. Repeat every week or ten days. Crop rotation. Crop rotation, destruction of affected vines and contiguous vegetable matter. See cabbage. Plant on soils free from disease. Plant resistant varieties.
<b>Turnip.</b> <i>Brassica</i> <i>capitata</i> . Linn. <i>Cruciferae</i> .	Cold weather plants. North temperate.	Loose, moist soil.	April, or July-Aug.—1 oz. seed to 100 ft. of drill. Rows 18 in. apart, or broadcast. Rutabaga, rows 2 ft., plants 10 inches in row.		
<b>Watermelon.</b> <i>Citrullus</i> <i>citrullus</i> . Schrad. <i>Cucurbitaceae</i> .	Warm and sunny climates. Southern temperate.	Light, quick, sandy soil, with strong clay subsoil.	May-June—1 oz. seed for 30 hills, or 4 to 5 lbs. per acre. Hills 8x10 ft.	Free from any viral disease.	

TABLE III. HORSES, CATTLE,

BREED BREEDER	CHARACTERISTICS	USES	BRIEF BREEDING RULES
<b>HORSES</b> <b>American Saddle Horse</b>	Head rather small and clean cut. Eyes wide apart, full, clear and prominent. Ears pointed. Long upright neck, sloping shoulders. Deep chest, short, strong back. Barrel ribbed with back. Strong coupling, quarters level, strongly muscled. Pasterns long and sloping. Bones of leg broad and flat, strong tendons. Height about 15 hands 2 inches. Weight about 1,000 pounds.	Saddle horse for pleasure, as a gaited horse, hunter, cavalry or commercial purposes. A light harness horse also.	1. Age of puberty 12 to 24 months. 2. Best age for breeding, 2 to 3 years. 3. Period of heat, 9 days after delivery and each 2 or 3 weeks thereafter; duration of heat, 2 to 3 days.



## GARDEN CROPS—Continued

INSECT AND OTHER ENEMIES	INSECTICIDES AND REMEDIES	TIME TO BEAT	YIELD PER ACRE	BULLETINS OF CULTURE
Peach borer.	Dig out borers in June and mound up trees. Apply gas tar or coal tar to trunk from roots up to a foot or more above surface of ground.	2 years. Good crop in 4 to 5 years.	5-10 bus. per tree in full bearing.	Cornell Bula. 176, 192, 276.
Curculio.	Spray just after blossoms fall with arsenate of lead, 6 to 8 lbs. in 100 gals. water, and repeat in a week. After fruit has set, jar tree daily over a sheet and destroy beetles.			
San Jose scale.	See apple.			
Pear psylla.	After blossoms fall, spray with kerosene emulsion diluted with 6 parts water or whale-oil soap, 1 lb. in 4 or 5 gals. water, or one of tobacco extract. Repeat every 3 to 7 days.	3 or 4 years. Fair crop in 5 to 12 years. Dwarf in 5 to 7 years.	A tree 20-25 years old from 6-15 bus.	Cornell Bula. 145, 198, 142, 272. Geneva Bula. 67, 64.
Leaf blistermite.	Spray with lime-sulphur wash in fall or spring, or with concentrated lime-sulphur solutions. 1 gal. in 10 gals. water.			
Pear slug.	Spray with 1 lb. paris green or 4 lbs. arsenate of lead in 100 gals. of water.			
Plum curculio.	Spray just after blossoms fall with arsenate of lead, 6 to 8 lbs. in 100 gals. water, and repeat in about a week. After fruit has set, jar trees daily over sheet and destroy the beetles.	3 years. Good crop in 5 or 6 years.	3 to 8 bus. per tree.	Cornell Bula. 28, 81, 131, 238. Geneva Bula. 96, 117.
Colorado potato beetle.	Spray with paris green, 2 lbs., or arsenate of lead, 4 lbs., in 100 gals. water, or arsenite of soda combined with bordeaux mixture.	80 to 140 days.	100-300 bus.	Geneva Bula. 101, 123, 221, 241, 294, 267, 279, 290, 311. Vermont 53. Maine 141.
Flea beetles.	Bordeaux mixture as applied for potato blight.			
Quince curculio.	When adults appear, jar them from tree onto sheets or curculin catchers and destroy them.	2 years. Good crop in 4 years.	100 to 300 bus.	Cornell Bula. 80, 145, 148.
San Jose scale.	See apple.			
Round-headed apple-tree borer.	See apple.			
Maggots.	Cover soil just after planting with a heavy dressing of un-leached wood ashes. Inject bisulphide of carbon into earth about plants.	30-45 days from seed.	2,800-3,500 bunches.	
Rawfly.	See blackberry.	1 year. Good crop in 2 and 3 years.	50-100 bus.	Geneva Bula. 134, 236.
Cane borer.	See blackberry.			
Leaf miner.		30 to 60 days.	200 barrels.	Rhode Island Bul. 41. Geneva Bula. 70, 96.
Striped cucumber beetle.	See muskmelon.	Summer, 60-80 days; winter, 120-160 days.	10 to 15 tons, winter.	N. Y. State Exp. Station Report 6th. New Jersey Bul. 94. Geneva Bula. 75, 112, 156, 158. Ohio Bul. 165. Cornell Bul. 31.
Squash-vine borer.	Plant a few early squashes between rows of late varieties as trap crop. As soon as early crop is harvested, remove and burn vines.			
Aphis.	Spray with kerosene emulsion diluted with 6 parts water or use one part of tobacco extract. Burn vines after fruit harvest and keep down weeds.			
Squash stinkbug.	Trap adults under boards in spring. Kill nymphs with kerosene emulsion.			
White grubs.	Dig out grubs from beneath infested plants. Destroy pupae by early fall cultivation of land.	1 year. Heavier crop usually in 2 years.	75-250 bus.	Cornell Bul. 79.
Boll worm.	Hand picking. Use of corn as a trap crop. Destruction of wormy fruit.	150 days from seed.	8 to 16 tons.	Cornell Bula. 32, 61. Michigan Bula. 19, 31. Florida Bul. 48. Kentucky Bul. 66. Connecticut Bul. 115.
Tobacco worm.	Hand picking.			
Nematode galls.	Crop rotation and preventing contiguity of host plants, notably cowpeas.			
Root maggots.	Inject bisulphide of carbon into soil about roots before grubs have burrowed deeply into tissues. Crop rotation.	60-70 days from seed.	600 to 1,000 bus.	Geneva Report 6th.
Flea beetle.	Spray with bordeaux or sprinkle with paris green diluted with lead plaster (1 part by bulk of paris green to 50 of plaster).			
Melon worm.	Spray with paris green, 4 ounces to 50 gals. water. Two or three sprayings a week apart.	120-150 days.	400-500 melons.	Georgia Bul. 38.
Melon louse.	Spray with a 1 to 20 mixture of kerosene and water, or kerosene emulsion, or whale-oil soap, 1 lb. to 1 gal. See muskmelon.			
Striped cucumber beetle.	See muskmelon.			
Flea beetle.	Hand picking and thorough spraying with bordeaux mixture and paris green.			

## SHEEP AND SWINE

BEST FOODS	DISEASES AND SYMPTOMS	TREATMENT	BULLETINS
<i>For the trotter.</i> When not in training, feed should be reduced at least one-half. Good oats and clean sweet timothy should constitute bulk of ration. Also a few carrots and a bran mash occasionally. In spring, when shedding, bran mash may be given more often to keep bowels open.	<i>Big-head.</i> —Symptoms: Loss of vitality, irregular appetite or other digestive disturbance. Tendency to stumble. Then intermittence or migratory lameness. Swelling of bones of face and jaw. Animal becomes thin, coat rough, skin tight and	Place animal under new conditions. Give lime, one peck slacked in a sack of water, more water being added from time to time. Give a table-spoonful of powdered bone meal in each feed, with free access to a large piece of rock salt. Feeds containing mineral salts, such as leas, cowpeas, oats and cottonseed meal are good. Animal should not work during active stage or be used for breeding.	Best references to breeds in study-books issued by breed societies.

TABLE III. HORSES, CATTLE,

BEST BREEDS	CHARACTERISTICS	Uses	BRIEF BREEDING RULES
<b>HORSES—Cont'd.</b>			
<b>Belgian Draft</b>	Short body set on short legs. Tendons of legs large. Head good size. Eyes small, neck short, thick and well crested. Shoulders heavily muscled, deep and wide, good barrel. Back short, broad and inclined to sag. Loins wide, short and very thick. Flank low and full. Hindquarters short, very wide, muscular. Lower thighs very wide, well muscled. Hocks round and meaty. Colors, chestnut, roan, brown and bay.	Draft and crossing, especially on grade draft mares.	4. Period of gestation 11 to 12 months. 5. Proper rations and sufficient exercise important during pregnancy. 6. Fecundity favored by: (a) Warm climate. (b) Abundance of exercise. (c) Generous supply of nutritious food, regularly given. (d) Crossing. (e) Heredity. (f) Full maturity of animal.
<b>Clydesdale</b>	Weight 1700 to 2000 pounds for stallions, 1500 to 1800 pounds for mares. Height, 16 to 16½ hands. Colors, bay, brown, black or chestnut, with white markings on face and legs. Head intelligent. Shoulder good, which gives a free, easy, long stride. High withers. Arm well muscled. Feathering on leg is fine, silky and long. Quarters and croup muscular. Sprang, strong pastern. Front action free and snappy.	Draft and crossing on native draft mares.	7. Variation in type caused by: (a) Changed conditions of life. (b) Heredity—union of two animals with diverse qualities. (c) Habit or use or disuse of parts. (d) Food.
<b>French Coach</b>	Height 16 hands. Weight 1000 to 1400 pounds. Rather upstanding. Smooth and symmetrical, fine quality, clean cut, intelligent head, long graceful neck, closely ribbed body, muscular quarters. Legs well set and fine. High free knee action, regular uplifting back action. Colors, bay, brown or black.	Coach and carriage horse, cavalry and fast saddle purposes. Crossing on common brood mares for production of grade coach horses for general city purposes.	8. Selection is of two kinds— (a) Natural. Survival of those possessing greatest ability to live and get food under particular conditions. (b) Methodical. Favoring and fixing of characters especially useful to mankind.
<b>German Coach</b>	Colors, bay, brown or black. Height 16 to 16½ hands. Weight 1350 to 1450 pounds. Deep round body, well proportioned, close ribs, neck long and high set on shoulders, neat head, intelligent face. Back short and strong, smooth at coupling, plump rounded quarters, strongly muscled limbs, strong hock good feet.	Saddle, carriage and draft. The horse-drawn work.	9. Heredity—like produces like. Offspring resembles parents in stature, form and feature. Normal and abnormal characters are inherited. Diseases are subject to laws of heredity. Characters that have appeared regularly through many generations transmit with greatest force. Variations also transmitted.
<b>Hackney</b>	Considerable substance, very smooth, gracefully curved outlines, rather short legs, head well proportioned, full bright eye, well-developed neck, shoulders long, sloping, well muscled. Body deep and round-ribbed. Muscular loins and quarters, strong backs, excellent action. Colors, brown, bay or chestnut, with white markings. Height 15 2 to 16 hands.	Heavy-harness horse. A desirable cross on common mares of much quality.	10. Correlation of parts. Whole organism so closely interwoven that change in one organ or set of organs almost certain to result in disturbance of the balance of other qualities and produce a change of other organs. Certain characters are normally correlated.
<b>Percheron</b>	Height 15 25 to 16 5 hands. Weight 1500 to 2000 pounds. Colors, gray and black. Active temperamental, intelligent head, deep body, wide muscular croup, clean-cut legs, joints clean and hard; legs show abundance of quality. Good action.	Draft and crossing to produce grade draft mares.	11. Atavism, or reversion to characteristics of remote ancestors, may occur. Leading causes are change of environment and crossing.
<b>Shetland Pony</b>	Height 10 hands 2 inches. Weight 325 to 375 pounds. Compact build, deep body, heavy muscular quarters, short legs, short broad chest, deep full neck, small head and ears, prominent eyes, docile disposition. Colors, brown, black and bay. Long shaggy coats, heavy, long mane.	Child's pony and light driving.	12. Inheritance of acquired characters. Acquired character is gained as result of action, sensation, or reaction from environment. Such characters may be inherited.
<b>Shire</b>	Conformation low, broad and stout. Heavy in build, slow in movement. Large girth, deep and strongly coupled with broad back, quarters heavily muscled, legs strong, feet large. Feathering on leg below knees and hocks. Weight 2200 pounds. Height 17 hands. Colors, brown, bay or black with white markings on face and legs.	Draft and crossing to produce grade draft horses.	13. Determination of sex. Many theories have been advanced, but in the present state of our knowledge it is not practicable to attempt to control the sex among the mammalian animals.
<b>Standard-Bred Trotter</b>	Head well proportioned, clean cut, neck long and muscular, crested in stallions. Shoulders well muscled, chest low, foreleg long from elbow to knee, short from knee to fetlock. Pasterns sloping, feet moderate in size, only in appearance. Hock and loin well muscled, hindquarters and croup well muscled and smooth. No fixed colors. Height 16 hands. Weight for mares 900 pounds, stallions 1150 pounds.	Racing, driving as a roadster, and breeding. Also heavy harness horse. Much used in breeding "cow ponies."	14. Prenatal influences of doubtful consequence. Pregnant animals should be kept quiet and free from causes which might produce extreme nervous shock.
<b>Suffolk Punch</b>	Low-set, short legs, deep body, muscular, durable feet. Head clean cut, with full forehead and Roman nose, neck full, with strong crest, chest deep and wide. Barrel deep, round-ribbed, and well let down on hind flank. Legs and hindquarters muscular. Height 16½ hands. Weight 2000 pounds. Color, chestnut.	Heavy draft and crossing on range mares.	15. Four methods of breeding: (a) Cross-breeding. A union of different breeds or races or breeding together of different strains of families within the same breed. Increases fertility, size and restores constitution, vigor and thrift. Breaks up established types, and destroys prepotency of the breed. Not certain to produce improvement. (b) Grading. Breeding of unimproved females to males of well-established breeds will invariably improve stock. (c) Inbreeding. Breeding together of close relations. Will fix desirable qualities. Inbreeding, however, weakens constitution, impairs fecundity. (d) Line-breeding. Union of animals more or less closely related. Favors fixation of characters, but may result in too great refinement and weakness of constitution.
<b>Thoroughbred</b>	Very deep, narrow chest, long legs. Refinement and clear definition of feature. Large nostrils, full, clear eyes, broad forehead, neck long and straight, sloping shoulder, muscular hindquarters, sharp withers, well marked superficial blood vessels, silky skin and hair. Colors, bay, brown, or chestnut, more or less white on face and limbs. Height 15 to 16 hands. Weight 900 to 1050 pounds.	Racing, sporting, breeding. Influence felt in all but draft breeds.	16. Pedigree and individual excellence should both enter into choice of breeding animals. Neither alone sufficient.
<b>Welsh Pony</b>	Good shoulders, strong back, neat head, best of legs and feet. Height 12 to 13 hands. Colors, bay or brown, gray or black. Great strength and endurance.	Child's pony and for hack and tradesmen's purposes.	

## SHEEP AND SWINE—Continued

FEED FOODS	DISEASES AND SYMPTOMS	TREATMENT	BULLETINS
<p>When horse goes into training, strength of food should be gradually increased. At first may have all hay he will consume. Later it may be necessary to limit it. No carrots. Bran mash once or twice a week if constipated. Oats gradually increased.</p> <p><i>For the driving horse.</i>—Oats lead among the grains. Bran mash for constipation. When horse is not taken from stable during day, the concentrates should be reduced by one-third. Laxative foods, such as clover or alfalfa hay or bran, in too large quantities should be guarded against.</p> <p><i>For the work horse.</i>—In general, horse should have over 2 pounds of provender daily for each 100 pounds of weight. Of this about two-thirds should be grain, depending on heaviness of work. Morning meal should be rather light, mostly of grain. Midday ration should not be large. Heavy feeding at night. In cold weather a more carbonaceous ration may be used. Equal parts of corn and oats better than larger proportion of oats.</p> <p><i>For the brood mare.</i>—Much the same as for work horse with the addition of more protein foods, as bran and oilmeal. If constipated, give bran mash. After foaling, a hot bran mash fed once a day has a cooling and laxative effect. To stimulate milk flow, good pasture grass best, but oats or wheat bran with equal weight of corn-and-cob meal is good.</p> <p><i>For the foal.</i>—Should begin to nibble grain from mother's box at 2 months, and at 3 to 4 months be eating well. Should have more protein than work horse. Oats, shorts, peas and perhaps corn, may constitute the grain. Alfalfa, clover and mixed hays may constitute the roughage. Abundant exercise important.</p> <p><i>For the stallion.</i>—During breeding season, grain ration should be mainly of good sound oats, varied by ration of corn, corn-and-cob meal, or barley. Wheat bran is valuable. The roughage should be clean, sweet hay, timothy or timothy and clover mixed.</p>	<p><i>Hives.</i>—Symptoms: Eruption of swellings from one-half to two inches in diameter on skin. The edges of swellings often cut sharply from surrounding tissue.</p> <p><i>Heat stroke.</i>—Symptoms: Horse stops sweating, appears droopy in harness, drows along, soon falls and becomes unconscious. Breathing rapid and shallow, pulse rapid and weak, body temperature excessively high.</p> <p><i>Moon blindness.</i>—Symptoms: Great irritation in eyeball, excessive flow of tears; eye kept closed and drawn back into socket; mucous membrane on inside of eyelid red, swollen and may protrude between closed lids; eyeball enlarged and cloudy, very sensitive to light.</p> <p><i>Lameness.</i>—Symptoms: Mucous membrane of mouth becomes congested with blood and protrudes below incisor teeth.</p> <p><i>Rheumatism.</i>—Symptoms: Animal becomes stiff and lame, followed by rise of temperature (104 degrees Fahr.). A swelling appears around joints of legs which is very painful to the touch. Location may change from day to day, and attacks be intermittent.</p> <p><i>Colic.</i>—Symptoms: Animal lags or stops in harness or walks around stall restlessly. Looks around at side, kicks at belly, may grit teeth. Tail goes a peculiar curl and is held extended. May lie down, roll, kick, or make violent movements, as clamping head against floor or hitting at self or manger. Attacks may be intermittent.</p> <p><i>Hæmorrhage.</i>—Symptoms: Distressing dry cough which often occurs in paroxysms. A double respiration present. Expired air comes from nose in jets, with pause between them.</p> <p><i>Bots.</i>—Symptoms: Cause irritation of walls of stomach and intestines and obstruction of passage between stomach and intestines.</p> <p><i>Worms.</i>—Symptoms: Presence of worms in feces the only sure sign.</p> <p><i>Curb.</i>—Symptoms: A rupture of the ligament on posterior surface of hock with swelling and heat, often lameness. Leg shows bulging backward below point of hock.</p> <p><i>Founder.</i>—Symptoms: Onset sudden with fever from 102.5 to 106 degrees Fahr., rapid respiration, increased pulse, intense pain in feet. Animal stands with hind feet well under body.</p> <p><i>Bone spavin.</i>—Symptoms: Onset gradual. Prominent bony growth most marked when horse is first brought out of stable and disappears on warming up. Bony enlargement on hock joint.</p> <p><i>Ringbone.</i>—Symptoms: Onset gradual with lameness. Local heat, swelling and pain in joint. Pre-tre of bony enlargement about joint.</p> <p><i>Spind.</i>—Symptoms: Lameness. Pressure over splint will cause gradual increase of temperature and there may be some redness. New bony growth may be seen or felt on front of internal splint bone.</p>	<p>Withheld feed for 24 hours. Then give bran mashes and small quantities of hay. Cleanse digestive tract by quart of linseed oil or 1½ pounds epsom salts. To relieve itching, apply alkaline solutions, 1 tablespoonful sodium bicarbonate to 1 quart of water, or a weak solution of ammonia.</p> <p>Treatment energetic. Apply ice bags to head and pour cold water over body to reduce temperature immediately. Give ½ pint whisky, followed by tincture of digitalis in 1 dram doses by mouth or ½ dram doses subcutaneously to stimulate heart. Continue cold water until temperature is reduced to 102 or 103 degrees Fahr. Rub limbs briskly with straw or the hands. Recovery is gradual, over week or two.</p> <p>Keep animal in the dark and wash off eyes several times daily with a 4 per cent solution of boric acid. A few drops may be dropped in eyes. Ice position may be used 3 or 4 days, after which warmth should be applied by covering eyes with cotton soaked in warm water. One or two drams of potassium iodide daily have been recommended.</p> <p>May be relieved by making a few shallow punctures in mucous membrane with a sharp knife that has been thoroughly sterilized. Such treatment demands expert care.</p> <p>Administer a cathartic, aloes balls containing 7 drams of aloes. Thoroughly rub affected joints with a stimulating liniment, as camphor or chloroform liniment. Follow cathartic with salicylates given in 1 dram doses, 3 or 4 times a day. 6 to 8 drams may be given 2 or 3 times daily in food. Keep horse in dry place and give plenty of fresh air.</p> <p>Give animal plenty of room. To allay pain, cannabis indica, 1 to 2 ounces, may be given, or morphine sulphate, 5 to 7 grains, given subcutaneously. Larger doses of either dangerous. An excellent prescription is fluid extract cannabis indica, 4 drams; tincture opium, 6 drams; sulphur ether, 1 ounce; sweet spirit of niter, 1 ounce. Give in 1 dose and repeat if necessary in an hour. To stimulate intestines, 8 drams of aloes or 4 pint of linseed oil. Injections of lukewarm water into rectum good. In fermentation colic tapping is quickest and surest method. This requires expert surgery.</p> <p>Condition incurable. Greatest benefit from regulation of diet. All duty hay should be withheld and small quantities of best timothy given sprinkled with linseed meal. Nutritious concentrated foods best: corn, oats and bran with carrots and turnips or apples suet in.</p> <p>Best treatment preventive. Eggs should be removed from hair before tenth day. If occasional bots noticed in manure, animal should be starved for 12 hours, allowing only water, after which give 2 teaspoonfuls of tartar emetic in water as a drench. Repeat in 4 hours; 8 or 12 hours later give a drench of 1 pint of 1 quart of linseed oil.</p> <p>Starve animal 12 to 15 hours. Then give tartar emetic in two-dram doses every 4 hours until 3 doses are given. Follow in 3 or 4 hours with 1½ pints of linseed oil.</p> <p>In acute inflammation cold water should be applied for 10 to 12 hours daily in constant stream. If lameness persists after a week, a blister of biniodide of mercury (part to vasoline 5 parts) should be applied and animal should rest for 2 to 4 weeks.</p> <p>Give tincture of acetone in 10-drop doses every 2 hours during first day. Allow animal to stand with affected feet in a soaking tub of cold water, or in puddle of soft clay, water to be kept cold by addition of ice. Give 2 ounce doses of saltpeter in a pint of water 3 times daily for 1 week. Case may require expert attention.</p> <p>Proper shoeing will assist in removing lameness. 4 to 6 weeks rest with repeated blisters will give temporary relief. Most successful treatment requires assistance of a veterinarian.</p> <p>Feet should be properly dressed and shod. If lameness is marked, prolonged rest and repeated mercurial blisters (1 part biniodide of mercury to 8 of vasoline) should be applied. If this is not successful, call veterinarian.</p> <p>For acute inflammation, let cold water run over part for several hours each day for a week. Hair should be clipped, then apply blister of one dram benzoin of mercury to one ounce of petrolatum. Animal should rest 3 to 4 weeks. In severe cases, call veterinarian.</p>	<p>Report of Kansas State Board of Agriculture, 1899.</p> <p>Farmers' Bulletin No. 170.</p> <p>North Carolina Bulletin No. 189.</p> <p>Florida Bulletin No. 72.</p> <p>Iowa Bulletin No. 118.</p> <p>New Jersey Bulletin No. 92.</p> <p>Special Report on Diseases of the Horse, Bureau of Animal Industry, U. S. Dept. Agr., 1903.</p>

TABLE IV. HORSES, CATTLE,

BEST BREEDS	CHARACTERISTICS	Uses	BEST FOODS
<b>CATTLE</b>			
<b>Aberdeen-Angus</b>	Black color, polled heads, round compact type, conformation, short legs, evenness of flesh when fat, deep, full hindquarters. Beef breed.	Beef. Very valuable in crossing and grading. Little value for milk.	<i>For dairy cattle</i> 1. The dairy calf—Avoid fattening feeds. Choose such as tend to develop a vigorous muscular system. Gradually substitute skimmed milk for full milk after first few days. A small quantity of some concentrated feed, as shorts, linseed meal or dressed meal, mixed into a jelly with water (1 part meal to 6 of water) is fed daily with the skimmed milk. Milk should be at blood heat, and the milk is considered to cold milk. At 6 or 8 weeks other feeds are given, preferably oats or wheat middlings, or a mixture of both. For older calves, milk feeds containing bran, barley, malt sprouts, etc., are desirable. Keep fine quality of early-curt milk after calves.
<b>Ayrshire</b>	Medium size, standard weight for cows 1000 pounds, bulls 1500 pounds or more. A little smoother than Jersey or Holstein but from behind wedge shape is evident. Tip of ears notched, horns white with black tips and curve outward and upward. Body large and deep, ribs well sprung, hindquarters often heavy. Udder shows high development of form and setting. Color variable through red, white, and brown in patches. Mild but active disposition. Dairy breed.	Milk and butter, so much for cheese. Crossing to improve grade herd.	2. Dairy heifer—As time of parturition approaches, feeding should be plain, good clean hay from clover or mixed grasses, corn fodder, corn silage (not to exceed 25 to 30 pounds a day) or roots. Both dry and suckling roughage is fed, and small amounts of bran, ground oats, shorts, gluten feed and perhaps corn. Shortly before calving, feeding of all grains except about 2 pounds of bran, is discontinued and dry roughage and roots are fed till cow freshens. Directly after calving the calf is fed of oatmeal, bran or shorts is given or warm water only. Utmost danger of fever is over, food should be very light and gradually increased for 2 or 3 weeks until cow is on full feed. Corn meal good for a heavy milking heifer.
<b>Brown-Swiss</b>	Weight for cows 1200 pounds and bulls 1800 pounds. Colors shade from light to dark chestnut brown. Light tuft of hair between horns, on inside of ears, and a narrow line along back. Nose black, mouth surrounded with meal-colored band. Horns with black tips, medium size. Face dishlike, large, full eye, ribs well sprung. Hoofs and tongue black, udder large, extending well up in front and rear. Teats large, well placed. Short legs. Dairy breed.	Milk for condensing and butter and cheese making.	3. Dairy cow— (a) Summer—Ample pasturage. Later in the season add cooling crops such as corn, alfalfa, peas and oats, ryegrass, etc. Summer silage, corn, red or other clover and alfalfa. 30 pounds of cooling crop or silage average allowance for dairy cows on poor pastures, to be increased as conditions demand. In case of heavy milking or very short pasture, add 10 to 15 pounds of wheat bran or wheat bran and oats, throughout season. (b) Winter—Succulent feeds should be provided during entire lactation period. Silage and roots are main available feeds. Best results from not over 40 pounds silage fed daily, and fed with some dry roughage, hay or corn fodder. Protein feeds, as clover hay, wheat bran or oil-meal, should be fed with corn silage. Clover hay or hay of other legumes stands first for dairy cows. Pure timothy, especially if late cut, is a poor feed. Other kinds of hay are millets, oat, sorghum, alfalfa and pea. Commercial concentrates are the cereals and mill refuse, starch or glucose factory refuse, brewery and distillery feeds and oil-meal. Good rule is to feed as many pounds of grain feeds a day as cow produces milk. Corn silage is a poor feed and to feed as much roughage as cow will eat up alone. Should give variety of feeds containing liberal amount of highly digestible substances. Feeding must be regular.
<b>Galloway</b>	Low, black animal, with long, soft, shaggy coat of black hair, hornless, well sprung in the ribs, resembling harrier in shape, which is evenly covered with juicy lean flesh. Head short and wide, forehead broad, face clean, nostrils large. Eye large and prominent. Neck short, clean. Shoulders broad, joining body smoothly. Hindquarters long, wide, well filled. Rump straight, wide, carrying width of body out uniformly, well filled with flesh. Thighs broad and thick. Legs short and clean. Beef breed.	Beef, hides and tanning. Very prepotent.	4. Dairy bull—Ground oats, wheat bran, gluten meal, oil-meal, grain and roots. 6 or 8 pounds per day for 1000-pound animal. Keep animal vigorous, not fat and lazy.
<b>Guernsey</b>	Clean-cut, lean face, long, thin neck, backline rising well between shoulder blades, pelvis arching and wide, rump long, shoulders large and deep, udder full in front, of large size and capacity. Teats well apart, and of good even size. Hair a shade of fawn with white markings, cream-colored nose, horns amber, small, curved and not coarse. Mature cows about 1050 pounds. Dairy breed.	Milk, cream and butter. Crossing.	<i>For beef cattle</i> Baby calves (10 to 12 months)—Require heavy grain feeding. Corn depended on largely, fed with a food rich in protein, as oil-meal or gluten feed. Oats and bran may be added if not too expensive. Good ration is 5 pounds corn, 2 pounds oats, 14 pound oil-meal, plenty of good clover or alfalfa hay. Corn silage is valuable. Daily ration must be increased as fast as calves can handle it. Long yearlings (18 to 23 months)—When calves are born in spring they are given little or no grain before or after weaning. Through summer and fall depend on grass. In winter, one-half of that weight of oil-meal. In the second fall feed close grown corn fodder, shelled corn, alfalfa, clover or cowpea hay. If non-legume roughage used, milk grain ration of one-half a day one-fourth oil-meal, gluten or cottonseed meal. Short two-year-olds—Finish by feeding grain in connection with spring dry summer pasture. With this system a light grain ration is fed the first winter and less than half feed of grain second winter. Shaded shell corn is effective for spring and autumn weaners. Fall feeding two-year-olds—Corn fodder on pasture. May begin about September 15 and continue in field for 3 months. Feed corn with 3 pounds of corn a day and increase till cow's capacity is reached. 3 pounds bran and 1 pound oil-meal or cottonseed meal per steer per day slowly increase gains. Winter feeding range two-year-olds—Cattle which have had no grain during summer and fall. Shaded corn most used for winter feeding. Alfalfa, clover or cowpea hay. Field-cured stalks with alfalfa equally good. After 6 to 8 weeks begin shelled corn gradually to replace alfalfa, clover or cowpea hay. Use only supplement corn with about 2 pounds per day of shelled corn, oil-meal, gluten or cottonseed meal. Total feed will take 20 to 25 pounds grain per day, plus all roughage desired. Range three-year-olds—Require smaller proportion of protein foods than above, but consume a larger proportion of grain to hay.
<b>Holstein-Friesian</b>	Clean-cut, lean face, long, thin neck, backline rising well between shoulder blades, pelvis arching and wide, rump long, shoulders large and deep, udder full in front, of large size and capacity. Teats well apart, and of good even size. Hair a shade of fawn with white markings, cream-colored nose, horns amber, small, curved and not coarse. Mature cows about 1050 pounds. Dairy breed.	Beef, especially early or "baby" beef.	
<b>Jersey</b>	Color, red and white. Head, including jaws and throat, white, with some neck down, dark brown, under belly, and on legs. Bush of tail white, white strip on top of neck to top of shoulders, remainder of body red. Head short, broad, broad, eyes full, horns rather strong and of whitish yellow color, free from black tips, more or less drooping, neck short and thin. Hides heavy and loose and covered with dense soft coat of hair. Breast broad and full, free from loose drapery. Nipples broad on top. Ribs well sprung and extending well backward. Rump bones wide apart. Legs short, straight and set well apart. Line of back straight and level. Quarters full and well rounded. Beef breed.	Milk, butter and cheese. Fair beef qualities.	
<b>Jersey</b>	Small head, muzzle black or dark in color surrounded by light or nearly strip of light skin and hair. Eyes prominent, bright and wide apart. Horns crumpled, small, often black, tipped. Neck fine, clean and small. Legs short, fine boned and small. Body well rounded, large and deep. Skin medium loose, yellow, with top fine milky hair. Udder large, not pendulous. Teats medium size, placed far apart. Back straight from shoulder to tail. Movement light and graceful. Cows 800 to 1000 pounds, bulls 1200 to 1500 pounds. Dairy breed.	Milk and butter.	
<b>Red Polled</b>	Weight for bulls 1800 to 2000 pounds, cows 1300 to 1500 pounds. Color red. Nose flesh color. Switch of tail and under white. Head medium length, side between ears, full well forward and prominent, neck of medium length, clean cut, straight from head to top of shoulder. Neck broad and deep, back long, straight and level, hips wide and well covered, legs short and straight. Udder full and flexible. Teats well placed and wide apart. Hides loose, mellow with full coat of soft hair. Dual purpose breed.	Beef, milk and butter.	
<b>Southdown</b>	Head wide between eyes, short from eyes to nostrils. Horns short, curved forward, waxy white with dark tips. Neck short and fine. Back straight, level and broad and deeply covered with fine flesh. Thighs wide and deep, well filled down to the twist. Body deep, squarely built. Flanks well let down, underline nearly straight. Legs medium length. Colors, pure red, pure white, a mixture of these colors, or roan. Beef breed.	Beef, crossing, grading. Fair results for milk, butter and cheese.	

**SHEEP AND SWINE—Continued**

BRIEF BREEDING RULES	DISEASES AND SYMPTOMS	TREATMENT	BULLETIN
<p>1. Age of puberty 4 to 18 months.</p>	<p><b>Caked bag.</b>—A part or all of udder becomes enlarged and firm. Cow is depressed and there may be a slight rise of temperature. Gland is sensitive to pressure and flow of milk is lessened. Milk is watery and may be tinged with blood.</p>	<p>Give sparingly of milk producing food. Massage udder with hand and rub in emporated oil or tincture of iodine 1 part, alcohol 8 parts. Then severe warmth should be applied by sponges wrung out of hot water and held against udder. In case of development of abscess or gangrene expert assistance will be needed.</p>	<p>Handbooks of all breeding and registration societies. Special Report on Diseases of Cattle and Cattle Feeding, U. S. Department of Agriculture, Bureau of Animal Industry, 1892. Revised 1904.</p>
<p>2. Best age for breeding best cattle, 20 to 25 months, dairy cattle 18 to 24 months.</p>	<p><b>Clapped Teats.</b>—Symptoms: Apparent on milking. May cause great difficulty in milking.</p>	<p>In fresh cows wean calf as soon as possible. See that teats are dry before cow goes out into the cold or wet weather. Bland antiseptic ointment, as a 10 per cent ointment of calomel in petrolatum should be applied after milking. Yellow oxide of mercury in a 5 per cent ointment is also good. Care must be taken to prevent milk becoming contaminated. In very bad cases milk should be withdrawn for few milkings with tube and udder massage. End of teat and milking tube must be sterilized before inserting. Astringent applications, as lead water with laudanum or tannic acid ointment, are good when there is considerable discharge from the sore.</p>	<p>Bureau Animal Industry Circular No. 51.</p>
<p>3. Period of heat, 40 to 60 days after delivery, if suckling the calf and 30 to 50 days if calf is taken away at birth. Period recurs each 3 weeks thereafter. Duration 12 to 24 hours.</p>	<p><b>Milk fever.</b>—Symptoms: Attack usually comes on within two days after calving. Cow is restless, staggering east, especially in hind legs, weakening of knees and fetlocks in front. This increases until paralysis becomes general and animal goes down. Cow takes very characteristic head-tucked round neck to side, usually left, rots against chest, causing peculiar arching of neck. If head drawn out straight, immediately flops back to above position. Animal quiet and insensible.</p>	<p>Because of paralysis of the throat, great care should be taken in administration of medicines by the mouth. Patient should be kept in an upright position on the breastbone, and not on her side. Only successful treatment is the injection into the udder of atmospheric air, which requires the assistance of a surgeon.</p>	<p>Same Bulletin No. 108.</p>
<p>4. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Sore tongue.</b>—Inability to eat, frequent movement of lips with formation of froth on their margin, driving of saliva. Ulcers occur on gums around teeth, inside lips and on tip of tongue. Mucosa dry and parched, and crusts and scabs form over the parts. The thin skin in clefts between jaws may become fissured and eroded, causing a slight swelling with pain. Animal takes position with back arched and feet propped under body.</p>	<p>Remove herd from pasture to barn or corral and feed on soft nutritious food, such as bran mash, ground feed and greens. Keep cool water in manger. Dose 2 heaping tablespoonfuls of borax or one tablespoonful potassium chlorate in each of first 2 buckets of water taken during day. Astringents, such as 1/4 tablespoonful alum, borax or chlorate of potash, should be placed on tongue. Teat may be treated with a 2 per cent solution of carbolic acid or of creolin. Fissures or cracks in skin benefited by carbolic vaseline or zinc ointment.</p>	<p>Connecticut Reports, 1895-1901.</p>
<p>5. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Indigestion.</b>—Symptoms: When stomach and small intestine affected, loss of appetite and rumination, coated tongue and emaciation. Constipation is usual, although diarrhea may be present. Fecal matter contains imperfectly digested food and more or less mucus. When large intestine is involved, appetite may not be affected. Diarrhea marked, droppings coated with mucus. No undigested food present. Animal will lose flesh and become hidebound.</p>	<p>In constipation, 1 quart of castor oil should be given. Easily digested and nutritious food should be given in small quantities. Green food best or hot bran mash, with small amount of good sweet hay. In diarrhea and fermentation a mixture of bismuth subnitrate 1 dram and creosote 1/2 dram shaken up with milk or given as a creosote 1/2 dram daily for 2 or 3 days is beneficial. For a tonic, powder, 1 dram, reduced to 1/2 dram, powdered gentian root 1 ounce, should be given in the feed 2 or 3 times daily for a few weeks.</p>	<p>Illinois Bulletin No. 142.</p>
<p>6. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Choking.</b>—Symptoms: Champing of jaws, driving of saliva, ceasing to chew and choking movements, head extended, eyes bulging, inability to swallow.</p>	<p>When obstruction is in pharynx, a block of wood should be placed in mouth between back teeth and object removed with hand. If in gullet, small amount of olive oil should be given at frequent intervals to lubricate the esophagus and allow object to pass into stomach. If this fails, the probing, a long, hollow, flexible tube, may be used. It is slid. By means of probing, foreign body gradually forced into stomach.</p>	<p>Indiana Bulletin Nos. 129, 130, 136, 137; Circulars Nos. 12, 14.</p>
<p>7. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Cough.</b>—Symptoms: Chilly sensations or a chill followed by rise of temperature to 103 to 108 degrees Fahr., loss of appetite and rumination, dry mucus, constipation, rapidity of pulse and respiration. Cough at first dry, harsh and painful. Later cough becomes moist and there is nasal discharge.</p>	<p>Animal should be placed in light, comfortable stall and given plenty of clear water. Keep bowls open with 1 pound of Glauber's salt. Feed green succulent materials if possible or bran mash and moistened hay. An electuary consisting of extract of belladonna leaves 5 grains, morphine sulphate 3 grains, powdered ipecacuan root 4 drams and sufficient syrup to make an electuary, should be given on tongue 4 times daily. If cough persists after the above treatment a mixture of ammonium chloride 1 dram in 1/4 ounce of brown mixture should be given 4 or 5 times daily.</p>	<p>Kansas Bulletin No. 81.</p>
<p>8. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Warts.</b>—Symptoms: Appear as grayish or grayish red projections of skin or mucous membrane. Favorite location is under the head and inside of head and neck, on lips and belly.</p>	<p>May be removed with scissors or fingers, or ligatured by rubber band or horsehair. Roots should be cauterized with tincture of iron, glacial acetic or lactic acid. Acids should not be used around eyes or mouth. When warts are found in large numbers, arsenic in form of Fowler's solution should be given in 1 teaspoonful doses twice a day for a 6-months calf.</p>	<p>Louisiana Bulletin No. 104, 115.</p>
<p>9. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Mange.</b>—Symptoms: Contagious disease. Points of redness, pimples, vesicles and formation of scabs. Intense itching which becomes unbearable at night in hot stables or when exposed to sun. Animals scratch, rub, and bite themselves. Hair falls out and skin is bloody. In worst stage skin moist and bloody, ulcerated, scabby, thickened and wrinkled.</p>	<p>A good combination of drugs for killing parasites is flowers of sulphur 1 ounce, vasoline (or lard) 10 ounces. Best method is to dip animal in a vat containing flowers of sulphur 24 hours, or make a time 12 pounds of vasoline 100 grains. This should be repeated in 10 days to 2 weeks.</p>	<p>Maryland Bulletin No. 84.</p>
<p>10. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Rings.</b>—Symptoms: Formation of circular patches on skin, which soon becomes devoid of hair. Outer layer of skin is inflamed and vesicles form which exude a gummy liquid. Scaly crusts are formed, usually on head and neck.</p>	<p>Remove crusts by washing with soap and water, then apply acetic acid, 10 to 20 per cent solution of iodine, or nitrate of mercury ointment once daily. Cleanse and wash with stable to destroy spores scattered by crusts.</p>	<p>Massachusetts Report, 1908.</p>
<p>11. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Scald.</b>—Symptoms: Inflammation of skin, usually on head and neck, caused by scalding with hot water or steam.</p>	<p>Remove crusts by washing with soap and water, then apply acetic acid, 10 to 20 per cent solution of iodine, or nitrate of mercury ointment once daily. Cleanse and wash with stable to destroy spores scattered by crusts.</p>	<p>Michigan Bulletin No. 149, 257; Circular No. 4.</p>
<p>12. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Scald.</b>—Symptoms: Inflammation of skin, usually on head and neck, caused by scalding with hot water or steam.</p>	<p>Remove crusts by washing with soap and water, then apply acetic acid, 10 to 20 per cent solution of iodine, or nitrate of mercury ointment once daily. Cleanse and wash with stable to destroy spores scattered by crusts.</p>	<p>Mississippi Bulletin No. 70, 121.</p>
<p>13. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Scald.</b>—Symptoms: Inflammation of skin, usually on head and neck, caused by scalding with hot water or steam.</p>	<p>Remove crusts by washing with soap and water, then apply acetic acid, 10 to 20 per cent solution of iodine, or nitrate of mercury ointment once daily. Cleanse and wash with stable to destroy spores scattered by crusts.</p>	<p>Missouri Bulletin Nos. 53, 58.</p>
<p>14. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Scald.</b>—Symptoms: Inflammation of skin, usually on head and neck, caused by scalding with hot water or steam.</p>	<p>Remove crusts by washing with soap and water, then apply acetic acid, 10 to 20 per cent solution of iodine, or nitrate of mercury ointment once daily. Cleanse and wash with stable to destroy spores scattered by crusts.</p>	<p>New York (Genova) Bulletin No. 317.</p>
<p>15. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Scald.</b>—Symptoms: Inflammation of skin, usually on head and neck, caused by scalding with hot water or steam.</p>	<p>Remove crusts by washing with soap and water, then apply acetic acid, 10 to 20 per cent solution of iodine, or nitrate of mercury ointment once daily. Cleanse and wash with stable to destroy spores scattered by crusts.</p>	<p>Ohio Bulletin No. 193.</p>
<p>16. Period of gestation 9 to 9 1/2 months (285 days).</p>	<p><b>Scald.</b>—Symptoms: Inflammation of skin, usually on head and neck, caused by scalding with hot water or steam.</p>	<p>Remove crusts by washing with soap and water, then apply acetic acid, 10 to 20 per cent solution of iodine, or nitrate of mercury ointment once daily. Cleanse and wash with stable to destroy spores scattered by crusts.</p>	<p>Oregon Bulletin No. 102.</p>

TABLE III. HORSES, CATTLE,

BEST BREEDS	CHARACTERISTICS	USES	BEST FOODS
<b>SHEEP</b> <b>Cheriot</b>	Medium size, hornless, face and legs white, body closely covered with wool of bold fiber bright and pure. Fleece forms almost a ruff about face. Deep and large in breast, back wide and straight. Short legs well set apart, hoofs black. Mature rams 200 pounds, ewes 150 pounds.	Mutton. Not superior as a wool producer. Wool of good quality, but light.	A clean and dry feeding place is essential. Rations should be feeding inoperative. Ordinarily best to feed sheep twice a day. Sheep need to have access to salt and water at all times.
<b>Cotswold</b>	Large, long-standing breed with heavy fleece of long white, lustrous wool. Angle between neck and body is small, head upright carriage. Head moderately small, face white or mixed with gray, eyes prominent, neck short, thick and strong, shoulders broad and full, back broad, breast broad and well forward, quarters long and full, mutton quite down to hock. Weight of ram 250 pounds, ewe 200 pounds.	Mutton and wool, the latter especially. Crossing on native and merino sheep.	Feeding lambs.—When ewe has a succulent feed, it is best to feed any grain until near weaning time. When a ewe has a weak lamb, she should get some grain. If lambs are to be sold before weaning, grain feeding must begin as early as possible. A mixture of three-fourths corn meal and one-fourth bran is satisfactory. Right after weaning it is well to have fresh pasture, or rape or other succulent feed. In addition, lambs should be fed liberally on grain.
<b>Dorset-Horn</b>	Face and legs pure white, flesh-colored nose. Both sexes have horns. Eyes prominent, neck short and symmetrical, shoulders broad and full. Chest full and deep, quarters well and full with mutton extending down to hock. Fleece medium grade, of even quality, extending over belly and well down on legs. Short stout legs. Weight for rams 200 pounds, ewe 160 pounds.	Mutton breed. Early breeder, valuable for production of hot-house or winter lambs. Fleece light.	For fattening lambs in corn is best, combined with peas and bran. Grain feeding must come gradually. For fattening mature lambs during fall, good grass pasture and rape or rutabagas, with a mixture of corn and oats, is most satisfactory.
<b>Hampshire Down</b>	Black face, head large, well covered with wool on forehead and cheeks, nostrils wide. Ears large and drooping, eyes prominent and lustrous, legs well under outside of body, straight, almost black. Chest deep and full with breast prominent and full, back straight, quarters long and deep in thigh. E-wee prolific and heavy milkers. Weight for rams 250 pounds, ewes 185 to 195 pounds.	Mutton and production of early market lambs. Fleece inferior.	To fatten lambs in a short period give preparatory feeding on rape or roots for about six weeks. Should have pasture before going on rape, which must be restricted in quantity. For grain feed, for grain, corn, oats, bran and oil-meal or cottonseed meal.
<b>Leicester</b>	Hornless, large size, rectangular form of body on clean legs, harn faces or carrying a very stout topknot. Head long, tapering toward muzzle, face wedge-shaped, covered with fine white hairs, eyes large and prominent, neck strong and moderately short. Breast deep, broad and full. Back broad and well finished. Legs of moderate length. Fleece fine, uniform, curly, with bright luster.	Crossing purposes to get early lambs for market. For wool especially, and mutton.	To fatten lambs in a short period give preparatory feeding on rape or roots for about six weeks. Should have pasture before going on rape, which must be restricted in quantity. For grain feed, for grain, corn, oats, bran and oil-meal or cottonseed meal.
<b>Lincoln</b>	Large size with heavy fleece of long wavy or curly wool and moderate tuft of wool on face. Color white, head large, without horns, body deep, back wide and straight. Legs broad and set well apart. Weight for rams 250 pounds, ewes 200 pounds.	Wool. Crossing, especially on merino stock.	To fatten lambs in a short period give preparatory feeding on rape or roots for about six weeks. Should have pasture before going on rape, which must be restricted in quantity. For grain feed, for grain, corn, oats, bran and oil-meal or cottonseed meal.
<b>Merino</b>	Distinguished by its very fine wool, usually delicately crimped. Wool generally short and dense. Grows to tips of ears and hocks of feet. Form, when shorn, angular, shoulders narrow, back not usually so straight or strong as English breeds, legs less straight and neck more slender. Ram usually has horns. Very enduring and resistant. The American merino has 3 to 5 heavy folds on neck, and folds on arm and sides and across hips. Fleece covers entire sheep except tip of nose and hocks. Ewes hidden by wool. Outside of fleece a dirty brown, but inside white. Ewes 80 to 100 pounds, rams 100 to 175 pounds. <i>Delaine merinos</i> have smoother bodies than the American, and is over folds and wrinkles. Mature ewes 100 to 150 pounds, rams 140 to 200 pounds. <i>Rambouillet merinos</i> have large bodies, usually smooth and free from wrinkles, except perhaps on neck. Fleece fine and white. Rams usually have large spirally curved horns, ewes hornless. Legs long. Rams 175 to 165 pounds, ewes 140 to 160 pounds.	Wool. Fleece especially fine, strong and heavy. Used for crumming to increase wool production. Delaine merino mutton of fair quality.	To fatten lambs in a short period give preparatory feeding on rape or roots for about six weeks. Should have pasture before going on rape, which must be restricted in quantity. For grain feed, for grain, corn, oats, bran and oil-meal or cottonseed meal.
<b>Oxford Down</b>	Largest of down breeds. Nearly straight on underline. Long and coarse fleece. Very stately appearance. Color of face and legs brown, which is often flecked with gray. Ewes very prolific and heavy milkers. Not hardy under American climatic conditions. Rams 250 to 350 pounds, ewes 180 to 275 pounds.	Representative mutton breed. Fleece long and coarse.	To fatten lambs in a short period give preparatory feeding on rape or roots for about six weeks. Should have pasture before going on rape, which must be restricted in quantity. For grain feed, for grain, corn, oats, bran and oil-meal or cottonseed meal.
<b>Shropshire Down</b>	Dark brown face and legs. Broad head, short face, thick muscular neck, body somewhat barrel shaped, except that it is straight on back. Body, head and legs to knees covered with fleece of even length and quality. Weight for rams 245 pounds, ewes 175 pounds.	Mutton and wool.	To fatten lambs in a short period give preparatory feeding on rape or roots for about six weeks. Should have pasture before going on rape, which must be restricted in quantity. For grain feed, for grain, corn, oats, bran and oil-meal or cottonseed meal.
<b>South Down</b>	Smallest of down breeds, but the model in form. Short straight legs, wide apart; broad level back thickly fleshed; long broad hips; neck short, thick at shoulder; head small, forehead full, face short, eyes prominent, ears small, face and legs uniform reddish brown. Fluidquarters carry down a very heavy; breast broad and prominent. Fleece compact, long and slow wool, white and carrying some yolk. Best weight for rams 200 pounds, ewes 150 pounds.	Mutton breed; used for growing to produce early lambs. Wool of good quality.	To fatten lambs in a short period give preparatory feeding on rape or roots for about six weeks. Should have pasture before going on rape, which must be restricted in quantity. For grain feed, for grain, corn, oats, bran and oil-meal or cottonseed meal.
<b>Suffolk Down</b>	Large, rangy sheep, black-headed, hornless, with long clean, black legs. Wool is of good quality and mutton is excellent. A good feeder and very prolific.	Mutton breed; used also for crossing. Wool is short.	To fatten lambs in a short period give preparatory feeding on rape or roots for about six weeks. Should have pasture before going on rape, which must be restricted in quantity. For grain feed, for grain, corn, oats, bran and oil-meal or cottonseed meal.
BEST BREEDS	CHARACTERISTICS	USES	BEST FOODS
<b>SWINE</b> <b>Berkshire</b>	Rather more than medium size. Boast of medium length, face dished. Ears nearly erect, well carried, lusty heavy. Neck short with considerable crest. Shoulder, back and rump of good width. Body deep. Ham thickly meated, strong constitution. Color black, with a white mark on face. White on each foot and on tip of tail.	Lard and pork. Meat best end of high quality.	Feeding boar.—Should not be overfed, but given just what he will eat up clean. Ration needs to be very liberal. Corn and pasture contain a succulent food. Young boars should be fed more concentrated foods than older animals. Corn should be fed liberally during breeding season, than remainder of year. Food should consist of grain (loam ground oats) to corn (loam ground) or wheat middlings or wheat bran, skimmed milk, succulent food (roots, finely cut), and a little salt.
<b>Cheshire</b>	Medium size. Body has good length. Shoulders and hams well developed. Face slightly dished. Ear small and erect. Hine fine and of fair quality. Color white. Black spots often occur on skin.	Lard and pork.	Feeding sows and young.—Good pasture (bluegrass, clover, fescue, alfalfa, cowpeas, soybeans, etc.) and a little grain. Sows need little except good pasture in August and September. In October about 2 pounds per head of corn should be given. Sows are bred they should have pasture and some grain, preferably equal parts of corn and oats at the rate of 3 or 4 pounds to 300
<b>Chester-White</b>	Medium size, face straight or very slightly dished. Ear droops and is somewhat loosely attached to head. Color white, hair in many specimens wavy or curly. Neck wide, deep, and short. Jaw smooth, neat and firm. Shoulders broad, deep and full. Chest large, deep, full in girth. Sides full, smooth, deep, ham broad, full, long, wide and deep. Back broad on top, straight or slightly arched, legs short and straight. Coat fine. Weight of boars 2 years old 500 pounds, ewes 450 pounds.	Lard and pork. Crossing, especially with Poland-China.	Feeding sows and young.—Good pasture (bluegrass, clover, fescue, alfalfa, cowpeas, soybeans, etc.) and a little grain. Sows need little except good pasture in August and September. In October about 2 pounds per head of corn should be given. Sows are bred they should have pasture and some grain, preferably equal parts of corn and oats at the rate of 3 or 4 pounds to 300

## SHEEP AND SWINE—Continued

BRIEF BREEDING RULES	DISEASES AND SYMPTOMS	TREATMENT	BULLETINS
<p><b>Age of puberty</b> 6 to 10 months.</p> <p><b>Best age for breeding</b> 18 to 20 months.</p> <p><b>Period of heat, regularly</b> during spring and autumn months. At other seasons period is irregular and often absent. Duration 5 to 3 days.</p> <p><b>Period of gestation</b> 5 months (21 weeks).</p> <p><b>One ram to 30 to 50 ewes.</b> Ram may be allowed to run with flock at any time. In north, breed in October to December; to get lambs in March-May; in South breed in August or September. Ewes have passed greatest usefulness at 7 to 8 years.</p> <p><b>Lambs</b> may be allowed to run with mother 3 to 4 months. Should be weaned by 4 months. To get house lambs, have rams and ewes in good physical condition, not overfat. Use a young ram and keep him well fed while in service. Give ewes abundance of succulent food and some corn. If ewe was not alone in fall, shear as early as safe. Have ram with ewe not earlier than March 15 nor later than May 15.</p> <p><b>For additional breeding rules see horse.</b></p>	<p><b>Sheep worm.—Symptoms:</b> Sheep become unthrifty, diarrhea, loss flesh and strength. A soft non-inflammatory swelling appears under the jaw. Diarrhea appears.</p> <p><b>Tapeeworms.—Symptoms:</b> Slow development. Weakness and emaciation. Flanks are drawn up or distended with gas. Unterside on feet. Excessive diarrhea may develop.</p> <p><b>Bloating.—Symptoms:</b> Abdomen becomes bloated and distended, filling with gas. Feeding falls off, animal shows stupidity, and respiration is difficult.</p> <p><b>Liver rot or fluke disease.—Symptoms</b> do not appear until disease is far advanced. Rapid loss of condition and weakness. Ewes become dry and may drop off. Eyes and lips become bloodless. Appetite falls off. Bowels irregular.</p> <p><b>Gid, staggers or steady.—Symptoms:</b> Animal moving in a circle, yawning, reeling, running forward with head elevated, turning about sharply, showing lack of control. Animal may be stupor. Eyes become staring, sight lost.</p> <p><b>Scab.—Symptoms:</b> Sheep scratch, rub and bite infected places. Little blisters form which rupture and exude a yellowish liquid which dries on skin and forms scab. Mites may be found in margin of scab. Wool mats and falls out. Should be shorn, sides and rump most affected.</p> <p><b>Sheep Ticks.—Symptoms:</b> Animals show itching and pain caused by ticks, and bite and scratch themselves.</p> <p><b>Foot rot.—Symptoms:</b> Lameness is apparent. Swelling reveals red raw spot in cleft just above the horny part. A sticky offensive discharge from hole in horn of hoof. Swelling just above hoof is swelling, accompanied by heat and sensitiveness.</p> <p><b>Paper skin or lung worm disease.—Symptoms:</b> A fatal or epidemic disease leaving animal almost suffocated. Discharge accompanies cough. In final stages skin becomes dry and papery. Appetite falls off, resulting in weakness and decline.</p> <p><b>Sore feet and sore mouth.—Symptoms:</b> Lameness and difficulty in eating. Ulcers appear on skin of feet above hoof and in membrane lining the lips.</p> <p><b>Garget.—Symptoms:</b> Udder is swollen and hot. Milk contains streaks of blood or clumps of pus.</p> <p><b>Grass staggers.—Symptoms:</b> Fainting apoplexy, constipation, abdominal pain, fever, restlessness, untenderness, delirium, running against objects aimlessly.</p> <p><b>Sewer.—Symptoms:</b> Offensive diarrhea, loss of appetite, distended abdomen, abdominal pain. Depression and weakness.</p>	<p>Change flock to high, well-drained land which has not been occupied by sheep for some time. Feed generously and provide plenty of salt. Mix 10 drams of coal-tar cresote in a gallon of water and give to lambs 4 to 6 tablespoonfuls and older sheep 8 to 10 tablespoonfuls every other day until 3 doses have been given. Feed should be withheld for 12 hours before and 3 hours after medicine.</p> <p>Fringed paper corn difficult to control by medicine. For broad tapeeworm give every sheep in flock 1/2 dram of extract of male fern in 2 to 4 ounces of castor oil, or 1 to 1 1/2 drams of kalmis. Withhold feed night before and in the morning of the day in which the medicine is given and give no water for 8 or 6 hours after medicine.</p> <p>Surgical treatment is necessary.</p> <p>Remove sheep to high, dry pastures and separate the sick from the well. Give nourishing food and plenty of salt. Infected pastures and pools should be drained and should be used for other purposes until clean. Snails should be destroyed. Drugs have little effect.</p> <p>Animals in advanced stage should be slaughtered. Carcasses of intested sheep should be completely disposed of so that dogs cannot get at them. As precaution, give dogs that have run of place 1 or 2 teaspoonfuls of castor-oil, followed 12 to 24 hours later by 25 minims of extract of male fern, followed with another dose of castor-oil in 2 hours. Keep dog tied and burn all discharges.</p> <p>Shear all sheep and confine for 2 to 4 weeks. Then dip in a mixture that will kill the mange mites. Lime and sulphur dip is very good. Repeat 7 to 10 days later. Each sheep must be kept in dip 2 minutes and head dipped at least once.</p> <p>Dip flock in lime and sulphur mixture or in a kerosene emulsion. Dip twice with an interval of two weeks. Ewes and nursing places must be thoroughly cleaned before animals are returned.</p> <p>Treat feet of healthy sheep with a solution of 1 pound chloride of lime to 12 quarts water or 1 pound carbolic acid crystals to 4 gallons water. Remove sheep to clean fields. To treat diseased sheep, cut away all loose or undetermined horn and all proud flesh, and stand sheep for 10 minutes in solution containing 4 pounds copper sulphate in 5 gallons water. When disease has reached deeper, area should be washed with a solution containing 1 ounce carbolic acid crystals in 20 ounces water, then doused with a powder of equal parts horse and man and again of stin and covered with soft bandages.</p> <p>Mark infested animals or separate from flock. Remove flock to clean inclosures and give nourishing feed, plenty of salt and pure water. Famine is best, using a mixture of flowers of sulphur and alcohol in a deep vessel floating in pan of water. Place in tight room and ignite. Attendant should remain to see that none suffocate. A mixture of 1 part salt to 25 parts of copperas should be kept constantly before sheep.</p> <p>Remove ewes and wash twice daily with solution of 1 tablespoonful creolin in 1 quart of water. Then paint infected parts only with Lugol's solution of iodine.</p> <p>Give 5 ounces of epsom salts dissolved in a pint of water, as purgative. Bathe udder often with warm water and rub with camphorated oil, and keep udder milked out clean.</p> <p>Affected animals should receive a strong laxative. Then give 2 tablespoonfuls, twice a day, of following mixture in a half pint of lined tea: Aromatic spirits of ammonia 1 1/2 ounces, alcohol 1 1/2 ounces, fluid extract of sassafras 1/2 dram.</p> <p>2 teaspoonfuls castor-oil containing 2 or 3 drops of creolin should be given at intervals followed by a tea made up of following mixture 3 times daily: Pepsin 1 dram, substrate of henneth 2 drams, cherry wine 3 drams, acid 1/2 dram, mucilage of acacia 5 ounces.</p>	<p>Best breed information found in booklets published by the various breed societies. Experiment station records will reveal innumerable experimental station bulletins.</p> <p>Arizona Bulletin No. 60, Report, 1908.</p> <p>Illinois Bulletin No. 120, Circular No. 125.</p> <p>Michigan Bulletin No. 178.</p> <p>Missouri Board of Agriculture, Missouri Bulletin 7 (1909), No. 2.</p> <p>Missouri Station, Circular Information No. 25.</p> <p>Nevada Bulletin No. 63.</p> <p>New York (Cornell) Bulletin No. 285.</p> <p>Oklahoma Report, 1908.</p> <p>Tennessee Bulletin No. 84.</p> <p>Wisconsin 23d Report.</p> <p>Virginia Bulletin No. 178.</p> <p>Wisconsin Report, 1907.</p> <p>Wyoming Bulletin No. 79, 81, Report 1908.</p> <p>Best breed information found in herbbooks published by various breed associations.</p> <p>Bureau of Animal Industry Bulletin No. 48.</p> <p>Farmers' Bulletin No. 331, Colorado Bulletin No. 146, Report 1907.</p> <p>Illinois Circulars Nos. 126, 133.</p> <p>Indiana Bulletins Nos. 100, 126.</p> <p>Iowa Bulletin No. 166.</p> <p>Mississippi Bulletin No. 107.</p>
BRIEF BREEDING RULES	DISEASES AND SYMPTOMS	TREATMENT	BULLETINS
<p><b>1. Age of puberty</b> 3 to 7 months.</p> <p><b>2. Best age to breed</b> 8 to 12 months.</p> <p><b>3. Period of heat, 3 days</b> after weaning the pig and every 9 to 12 days thereafter. Duration 1 to 3 days.</p> <p><b>4. Period of gestation</b> 112 to 115 days.</p>	<p><b>Mange.—Symptoms:</b> The crusts about eyes and ears are often the first evidence of disease. Disease spreads until it may cover entire body. Hairs fall itching. Sometimes loss of flesh and decline.</p> <p><b>Verminous bronchitis.—Symptoms:</b> Bronchial tubes inflamed, very severe coughing. Growth stunted. Caused by a small round worm in bronchial tubes.</p> <p><b>Forcible distemper.—Symptoms:</b> First, gradually extending over entire body.</p> <p><b>Rickets or rachitis.—Symptoms:</b> Animals stunted and poorly nourished. Lameness appears and bones about joints swell. Bones may become very weak and body fall over.</p>	<p>Crusts may be removed by scrubbing with soap and water followed by application of a 3 per cent solution of creolin or an ointment made of sulphur 2 drams, creosote 1 dram and vasoline to make an ounce. Crusts are daily until all parasites are killed. When large numbers are affected, dipping in lime and sulphur dip (described under mange) is necessary. Dipping should be repeated after 6 days.</p> <p>Kill adult pigs for food in first stages. Give young pig a teaspoonful of turpentine in swill food 3 times daily.</p> <p>Surgical treatment requiring extreme care is necessary.</p> <p>Feed concentrated and nutritious food rich in proteins. Milk, muddings, best ground bone turn are good. Lime water should be given. Sunlight, fresh air, clean quarters and exercise must be provided. Precipitated phosphate of calcium 1 to 3 dram doses 2 or 3 times daily in the feed, with oil of phosphorus in 1 drop doses is helpful.</p>	<p>Best breed information found in herbbooks published by various breed associations.</p> <p>Bureau of Animal Industry Bulletin No. 48.</p> <p>Farmers' Bulletin No. 331, Colorado Bulletin No. 146, Report 1907.</p> <p>Illinois Circulars Nos. 126, 133.</p> <p>Indiana Bulletins Nos. 100, 126.</p> <p>Iowa Bulletin No. 166.</p> <p>Mississippi Bulletin No. 107.</p>

TABLE III. HORSES, CATTLE,

BEST BREEDS	CHARACTERISTICS	Uses	BEST FOODS
<b>SWINE—Cont'd</b> <b>Duro-Jersey</b>	Medium size, fine bone. Snout medium length, face slightly droop. Ears drooped, level heavy body weight and dark on short legs. Ham heavily fleshed. Cherry red the popular color, but yellowish red and chestnut are often seen. Weight of boars 2 years old 600 pounds, sows 500 pounds.	Lard and pork. Crossing, especially with Berkshire and Poland-China.	or 400 pound sows, until late December. Then substitute daily 5 or 6 pounds of ration, ground oats 2 parts, ground corn 3 parts and bran 1 part. Skimmed milk is especially recommended for nursing grain ration. In winter give liberally of clover, alfalfa, or peas.
<b>Hampshire or Thin-kind Swine</b>	Medium size, face straight, ear inclined forward, but does not droop. Jaw light, as is also shoulder and ham. Black of medium width. Legs of medium length and bone of good quality. Color, black extremities with a white belt 4 to 12 inches wide encircling body and including fore-legs, which should also be white. Weight, boars 2 years old 450 pounds, sows 400 pounds.	Bacon and pork. Almost general purpose.	For first 24 hours after pigs are born, give sow no food. Then give light ration of 34 ground corn, 15 shorts, 14 ground oats mixed with 3 to 5 pounds skimmed milk to one of grain. Pigs should be given a little feed at 3 weeks, using same ration as for sow. Feed liberally to 3 months of age.
<b>Large Yorkshire or Large White Swine</b>	One of the largest breeds. Snout of medium length, with little or no dish. Moderate dish in face. Jaw of good width and muscular. Ears rather large, firmly attached, fringe with fine hair. Shoulders and back of medium width. Side long. Ham lighter than that of lard type with flesh carried well round inside of thigh. Legs medium length. Bone fairly heavy, clean and finny. Color, white.	Bacon. Valuable for crossing on Poland-China, Berkshire and Chester-White.	The bacon Avg.—Best foods are mixed peas, barley, oats, shorts and skimmed milk. Barley, ground or soaked over night is feed most used. Oil-meal or tankage may be added advantageously. Summer feeding on pasture of clover, alfalfa or rape.
<b>Poland-China</b>	Medium size. Face slightly dishd. Jaw full and heavy. Ears fine, firmly attached; about one-third of ear droops. Neck short, thick and heavily arched on top. Shoulder heavy. Side short. Back wide. Ham very wide and deep. Legs short, bone fine. Black with 6 white points on face, feet and tip of tail. Weight of boars 2 years old 600 pounds, sows 500 pounds.	Lard and pork. Valuable in crossing.	For first 24 hours after pigs are born, give sow no food. Then give light ration of 34 ground corn, 15 shorts, 14 ground oats mixed with 3 to 5 pounds skimmed milk to one-third pound of tankage daily. For the last 4 or 5 weeks of fattening they should be removed from the sow and fed as much corn as they will consume. Method will vary according to method of feeding the steers. Pigs that do not follow steers are fattened on pasture, clover or alfalfa or run-jam being best. Corn alone or abundant clover pasture is excellent ration.
<b>Tamworth</b>	Should have golden-red hair on a flesh-colored skin, free from black. Snout long and straight. Ear large. Jaw strong and light. Neck and shoulder are light; back and loin of medium width, side of good length, moderately deep. Rather deficient in ham. Legs long and strong.	Bacon. Crossing, especially with Berkshire.	

TABLE IV. CHICKENS, TURKEYS,

BEST BREEDS	CHARACTERISTICS	Uses	BEST FOODS
<b>CHICKENS</b> <b>Plymouth Rock</b>	Three varieties, the barred, white and buff. Back and body rather long, hence the name. Single combs, yellow shanks. Cocks weigh 9½ pounds and hens 7½ pounds.	General purpose, for both meat and eggs. Brown egg.	A good ration must contain sufficient digestible nutrients to meet needs of animal. Animal's appetite is safest guide as to amount of food needed.
<b>Wyandotte</b>	Eight standard varieties, white, buff, black, silver, golden, silver penciled, partridge and Columbian. A bird of curves, back short and broad, body deep and round, breast broad and deep, with a low-set tail. Shanks short and carried well apart. Colors silver, white, black, buff and mixtures. Close-fitting rose comb. Abundant fluffy, close-fitting plumage. Weight 8½ pounds for cocks, 6½ pounds for hens.	General purpose. Brown egg.	For raising young chickens, 1 pound protein to 4 pounds carbohydrates. The ration should consist of foods which the fowl likes. The following grains are preferred by fowls in order named: wheat, corn, oats, peas, barley, buckwheat, rice. The ration should provide a good variety and sufficient bulk to aid digestion. Wheat, bran, clover and alfalfa meal provide bulk in ration. The ration should contain easily digested foods, as whole grain and part ground feed. Feed at least one-third ground grain, as wheat or bran middlings, ground oats, corn meal and very small quantities of gluten meal. Wheat is most desirable of grains. Corn is used largely because it is cheaper. Hay oats raise best. Meat in some form, as beef scrap or green cut bone or skimmed milk should be included in every ration. It should form at least 10 to 15 per cent of total food consumed each day. Green food in form of cabbage, roots or cut clover should be given each day. Grit in form of crushed oyster shells or mortar is indispensable. Because of the expense of the latter, it is better to use meal and buckwheat middlings may be much used. Chickens should be fed on a ration that will keep them in good health and produce the most active breeds in winter. The lighter and more active breeds can be a great deal better than the heavy and more sluggish breeds.
<b>Rhode Island Red</b>	Three varieties, single comb, rose-combs and pea-combs (or buck-eyes). Tail color black. Rhode Island red has a red surface of body plumage, with a red or mahogany color, free from slate. Buckeye surface color is dark, rich carot, and under-color allows a bar of slate-color next to surface. Body of both 1 long. Rhode Island red level body, Rhode Island red slight elevation in front. Weight of Rhode Island red cocks 8½ pounds, hens 6½ pounds, buckeye cocks 9 pounds, hens 6 pounds.	Meat breed. Brown egg.	
<b>Brahma</b>	Two varieties, light and dark. Shy w hen long and toe feathering, thick, close plumage. General color of light Brahma, white, with black tail and black erect stripes in both hackle and saddle feathers. In dark Brahma, wings of cock encased by heavy black bar, and entire breast, body, leg and toes black. Back, wings, body and breast of female have a basis of gray on which are distinct dark pencillings. Weight for dark cocks 11 pounds, hens 8½ pounds; for light cocks 12 pounds, hens 9½ pounds.	Meat breed. Brown egg.	
<b>Cochin</b>	Four varieties, buff, partridge, white, black. Peculiarity is an appearance of massiveness and bulkiness. Heavy, short feathering is piled high on back and extends wide at sides. Extensive thigh and shank feathering. Comb single, low, close on head and evenly serrated with five distinct points. Cocks weigh 11 pounds, hens 8½ pounds.	Meat breed. Brown egg.	
<b>Leghorn</b>	Eight varieties, single-comb, rose-comb, single-comb and rose-comb white, single-comb and rose-comb buff, single-comb black and single-comb silver duckwing. Characterized by early maturity and great activity. Large, pendulous comb.	Egg production. White egg.	
<b>Minorca</b>	Three varieties, single-comb black, rose-comb black, single-comb white. Long body, carried rather upright, deep at breast with back tapering sharply toward tail, which is long and carried rather low. Comb large and erect, pure white. Cocks of rose-comb weigh 8 pounds, hens 6½ pounds. Single-comb cocks weigh 1 pound heavier.	Egg breed. White egg.	
<b>Dorking</b>	Three varieties, colored, white and silver-gray. Body long and deep. Carries abundance of flesh. Skin white. Colored largest cocks weigh 9 pounds and hens 7 pounds. White cocks weigh 7½ pounds, hens 6 pounds. Silver-gray variety is between these two. All have a fifth toe.	General purpose, meat especially. Egg of medium color.	
<b>Orpington</b>	Three varieties, buff, black and white. Long body, abundant plumage, white skin. Short heavy shanks. Tendency to feathering on shanks. Cock weighs 10 pounds, hens 8 pounds.	General purpose. Egg tinted.	
<b>Houan</b>	Color black and white evenly broken in alternate spots throughout entire plumage. Head ornaments of crest and beard. White skin. Carry flesh on each foot. Cocks weigh 7 pounds, hens 6 pounds.	Egg breed. White egg.	
<b>Hamburg</b>	Six varieties, golden spangled, silver spangled, golden penciled, silver penciled, white and black. About size of the Leghorn.	Egg and fancy breed. White egg.	
<b>Indian</b>	Two varieties, Cornish and white. Beaks and shanks yellow. Bird of strong proportions. Back and wings of cock mixture of red and black, tail and breast black. Hen's back, wings, breast and body a rich buff penciled with black. Cocks weigh 9 pounds, hens 8½ pounds.	Meat breed. Tinted egg.	



## SHEEP AND SWINE—Continued

BRIEF BREEDING RULES	DISEASES AND SYMPTOMS	TREATMENT	BULLETINS
Boars do not show best form before 4 or 5 months old, and should not begin service under 10 months. Give best service at 8 years old. Sows should be prolific and good milkers. For pork, breed sows any time after 8 months of age, but for pure-bred breeding stock 12 months of age better. Sows should breed twice a year, to get 1 litter in early spring (April to May), the second in September or October. Pigs may run with sows 8 to 10 weeks.	<b>Sore mouth.</b> —Symptoms: Aversion to food and saliva dripping from mouth. Gums become congested and later necrotic patches develop, especially about front teeth and tusks. Offensive odor to mouth. Jaws are swollen, lips and mouth often cracked and covered with scabs. Rapid decline and prostration. <b>Cottontail poisoning.</b> —Symptoms: Loss of appetite accompanied by thumps. Animal drops over, hicks and squeals for a few minutes and dies. <b>Catarrhal rhinitis or snuffles.</b> —Symptoms: Animal more quiet than usual and may experience slight chills. Eyes are red, appetite lessened and constipation is present. Watery discharge from nostrils, which later thickens and makes breathing difficult. <b>Thumps.</b> —Symptoms: Sets in suddenly with a jerking or twitching movement of flanks, which may become excessive, producing a thumping. Animal keeps up with and has a poor appetite. May fall off in weight. <b>Hog cholera.</b> —Symptoms: Continuous fever and discoloration of skin. Animals lack spirit and lie huddled together. Refuse to move when disturbed. <b>Swine plague.</b> —Symptoms: Aversion to food. Much coughing, back arched, grunts broken, eyes reddened and skin in front takes reddish tinge.	Affected animals should be separated from well animals and pens thoroughly disinfected. Wash mouth with 2 per cent warm creolin solution to remove patches. Then a 10 per cent ointment of salicylic acid may be applied in severe cases. Treat daily until almost is cured.  Complete elimination of cottonseed meal from ration is the only positive preventive. Given in proper quantities it is normally safe, but its use demands special precautions.  Keep animal warm and provide clean, well-lighted pen. Liquid foods should be warmed, 1½ ounces of castor oil should be given. Fumigation by burning tar in close room may help. To loosen nasal discharge, tincture of belladonna leaves in ½-teaspoonful doses twice daily may be added to feed.  If caused by worms, give dried sulphate of iron in will once a day for 7 or 8 doses. ¼ pound sulphate for 40 pigs. If caused by indigestion, give less food and allow access to charcoal and wood ashes. Exercise should be allowed also on free pasture. To first stage give every 4 hours a physic of 2 ounces raw linseed oil followed with 2 to 10 drops of tincture of opium in a little oil. Demands expert and immediate care.	Ohio Bulletin Nos. 208, 212. Oklahoma Bulletin No. 90 Pennsylvania Bulletin No. 95 South Dakota Bulletin No. 165 Wisconsin Bulletin No. 184; Report 1907.
For additional breeding rules see horses.		Demands expert and immediate attention.	

## DUCKS AND GEES

BRIEF BREEDING RULES	DISEASES AND SYMPTOMS	TREATMENT	BULLETINS
Very close inbreeding tends to produce chicks that are weak or fall on easy prey to disease or are infertile. Line breeding is better. Mate offspring of a pair with father and mother rather than brother with sister.  Grandchildren of original father may be mated to those of original mother.  Selection involves the careful inspection of the individuals of any generation and preservation for breeding of only the best.  Hybridization involves the crossing of two strains, varieties, or races in order to combine the favorable qualities of the two. Sex control means at present beyond human power.  Period of incubation is 19 to 24 days, average 21.  To get early market poultry mate late in fall. Brahmas and Cochins pullets begin to lay at 9 to 9 months. Leghorns and other small breeds 4 to 6 months. Plymouth Rock and Wadsworths, 5 to 7 months. Mate breeding pen 6 weeks before earliest date for hatching. Hens should lay a few weeks rest before breeding season, for high-class stock. Breeding stock should have free range or, if confined, be not crowded and fed green feed and meat scrap in addition to that upon which they rest. Hold eggs for hatching in cool, dry place, at temperature of 40 to 45 degrees Fahrenheit for setting should be in fair condition, should feel hot to hand when handled, and should allow herself to be handled freely.	<b>Simple canker.</b> —Symptoms: Appears as yellowish or whitish patches in mouth and on skin about feather roots, on abdomen, back, neck and head. <b>Lice.</b> —Symptoms: May be found under wings and on skin about feather roots, on abdomen, back, neck and head. <b>Mite.</b> —Symptoms: Red, black and grey. Bred in cracks and crevices of building or under droppings.  <b>Diphtheria.</b> —Symptoms: Fowl becomes suddenly ill and loses appetite; legs are hot, comb hot and deep red. Difficult breathing and sharp cough. Inflammation of throat. Legs and wings may become paralyzed. <b>Snail leg.</b> —Symptoms: Rough grayish or whitish scales and crusts on shanks and feet.  <b>Colds.</b> —Symptoms: Sneezing, watery eyes, discharge from nostrils and swollen face. Bubbles or drope form in corners of eyes.  <b>Catarrh (contagious) or roup.</b> —Symptoms: Peculiar, strong offensive odor. A glairy water-white or yellowish discharge from nostrils and under eyelids. Legs hot. Comb and wattles hot and deep red. Characteristic roup smell always present.  <b>Worms.</b> —Symptoms: Will appear in the excrement.  <b>Gapes.</b> —Symptoms: Difficult breathing and characteristic gaping attitude. Caused by a parasitic worm which attaches itself to mucous lining of windpipe.  <b>Diarrhea.</b> —Symptoms: Looseness of bowels. Discharges yellowish, greenish, dark or watery.  <b>Contagious diarrhea.</b> —Symptoms: Thirst, little appetite, stupidity, bowel discharge loose and watery, often dark or bluish green, sometimes blood streaked. Comb and wattles dark red or purplish, and legs hot.	Dust powdered boracic acid on sores or apply pure creolin with soft cotton cloth. Fifteen grains boracic acid in 1 ounce water may be used freely as a wash.  Dust thoroughly with pure fresh Perisan insect powder. Work well down to skin. Repeat in 10 days.  Keep roost clean. Use abundance of mixture of 1 quart kerosene, 1 quart creolin and 1 quart liquid lice killer for painting roosts and droppings-board.  Segregate sick fowl and preferably kill and burn. May give fowl four times daily a 0.01 grain tablet of biniodide of mercury. Cleanse mouth and throat with strong perfume of hydrogen, or 1 tablespoonful creolin in 4 fluid ounces of water.  Apply ointment made by mixing 1 teaspoonful creolin to 1 cupful melted lard. Stir until cool and apply daily until scales and crusts drop off.  Sleeping quarters should be well ventilated. Give condition powders or tonic in food or drinking water, or season mash with ginger and red pepper. Following mixture will usually cure if taken at start: 20 to 30 drops spirit of camphor with a tablespoonful granulated sugar. Dissolve in pint of drinking water and allow birds access to no other drink.  Kill and burn all very sick birds. Segregate in an open shed all that show symptoms. Use creolin dip—1 teaspoonful pure creolin in 1 pint water and dip heads in solution, using fresh solution for each bird—and make fowl inhale creolin vapor by spraying over with the same solution. Thoroughly cleanse head, mouth, eyes, nostrils and throat with this disinfectant, and keep fowls in wide open, fresh pens.  Allow no food for 12 hours. Then give in 1 dose a mixture of 3 teaspoonfuls oil of turpentine and 1 tablespoonful sweet oil. Administer directly into crop through rubber tube passed down throat. May be necessary to repeat in 12 to 24 hours.  Remove worms by a loop of horsehair or a wire gape-worm extractor dipped in kerosene. Soaked milk, thickened with well-boiled flour and seasoned with ginger, makes a desirable food and remedy.  Segregate affected birds and remove to clean place. Give calomel in 0.01 of a grain dose 3 times daily. For difficult cases dissolve 12 tablets of mercury bichloride, 0.001 of a grain drug strength each, in 1 quart of drinking water and allow no other drink. This medicine should be given less frequently as soon as improvement appears.	Ontario Department of Agriculture Bulletin No. 151.  Farmers' Bulletin No. 41, 51, 64, 177, 182, 200, 234, 257, 255, 267. Bureau of Animal Industry Bulletin No. 110; same Circular No. 140. Arizona Bulletin No. 80. Connecticut Bulletin No. 52, 55.  Kansas Bulletin No. 152, 164. Maine Bulletin No. 157, 159, 163, 166, 168 (contains bibliography). Maryland Bulletin No. 138. Missouri Board of Agriculture Missouri Bulletin No. 5 (1908), No. 12. New York (Cornell) Bulletin No. 212, 258, 274, 287, 282, 284. Oregon Bulletin No. 100; Circular No. 4. Pennsylvania Bulletin No. 87. Rhode Island Bulletin No. 126, Report 1908.

TABLE IV. CHICKENS, TURKEYS,

BEST BREEDS	CHARACTERISTICS	Uses	BEST FOODS
<b>CHICKENS</b> —Cont'd <b>Bantam</b>	Ornamental birds of many varieties: Sebright, rose-comb, booted white, Hrahma, Cochon, Japanese, Polish, game, black-breasted red Malay.	Fancy and ornamental varieties of many foregoing breeds.	See page 408.
BEST BREEDS	CHARACTERISTICS	Uses	BEST FOODS
<b>TURKEYS</b> <b>Bronze</b>	Largest and hardiest of all varieties for the market. Adult cock 36 pounds, hen 20 pounds.	Meat.	The young must be fed with care at first, allowing only bread and milk mixed with $\frac{1}{4}$ pot cheese and a little chopped onion, given 2 or 3 times a day. Once or twice a day feed finely cracked corn, wheat and oatmeal mixed in equal parts. After second week, bread and milk should be decreased and grains and pot cheese increased. Fine grit and charcoal should be available. Water should be provided in such a way that young turkeys cannot become wet. When turkeys graze in fields during day they should be fed grain at night, corn, wheat, oats or peas.
<b>Narraganset</b>	Plumage bronze and black with a mixture of white. Second in size to bronze. Cock 30 pounds, hen 18 pounds. General color gray.	Meat.	
<b>Buff</b>	Feathers a reddish buff, the wing flights being white.	Meat.	
<b>Slate</b>	Plumage of a bluish slate shade. Cock 27 pounds, hen 18 pounds.	Meat.	
<b>Black</b>	Plumage pure black. Otherwise same as above.	Meat.	
<b>White Holland</b>	Plumage pure white throughout; has pinkish white shanks. Cocks 26 pounds, hens 16 pounds.	Meat.	
<b>Bourbon Red</b>	A kindred variety to the buff, having deep reddish-buff plumage.	Meat.	During breeding season, one feeding a day of mixture of equal parts by weight of wheat middlings, wheat bran, corn meal, ground oats and meat scrap, stirred up with skimmed milk, should be given. In fattening turkeys for market they should be fed all the whole corn they will eat at night. In morning a mixture of 6 parts corn meal, 3 parts wheat middlings, 1 part beef scrap, mixed as thick paste with sour skimmed milk may be given. Turkeys do best on free range.
BEST BREEDS	CHARACTERISTICS	Uses	
<b>DUCKS</b> <b>Boucon</b>	Largest and most popular of all colored market varieties. Weight 9 pounds for drakes, 8 pounds for ducks.	Meat.	
<b>Black Cayuga</b>	Largest solid black duck known. Mature pair weighs 15 pounds. Body of good length.	Meat.	A fair layer.
<b>Pekin</b>	Largest white duck in existence. Specimens weigh as high as 10 or 12 pounds. Head and beak long and of good size, beak orange-yellow, back, breast and body long, broad and deep, with deep keel. Creamy white.	Meat.	A good layer.
<b>Crested White</b>	Medium-sized white duck with large white crest or topknot, about two-thirds the size of Pekin, which it resembles in color and shape of body, except crest.	Meat.	A fair layer.
<b>Indian Runner</b>	Head long and flat, light fawn in color, cap and cheek markings light fawn, bill straight, green with black band at tip, eyes basal, neck white from head to beginning of breast markings, back light fawn or gray, breast light fawn, body light fawn, rear half white. Shanks and feet orange-yellow. Carriage very erect. Small size.	Meat.	The best layer.
<b>Colored Muscovy</b>	Good size, black and white in color, black predominating. Side of head and region around eye are without feathers and are carunculated or corrugated and scarlet. Builds her nest and never scatters her eggs. Never quacks. Active on wing.	Meat.	
<b>White Muscovy</b>	Same as colored muscovy except that it is pure white.	Meat.	
BEST BREEDS	CHARACTERISTICS	Uses	
<b>GOOSE</b> <b>African</b>	Large head with pronounced black knot and heavy gray dewlap under throat. Neck long, back broad and flat, breast full and round, body large and upright, thighs short and plump. Shanks medium length and dark orange color. Wings of good size, close fitting. General color, gray. Mature gander 20 pounds, goose 18 pounds.	Meat and feathers.	
<b>Emden</b>	Color white. Square, compact body. Neck long and massive appearing, large head. Medium-size orange-colored bill. Back slightly arched, breast round, deep and full. Shanks short, stout, deep, orange color, thighs strong, wings large, tail short. Eyes bright blue. Mature gander 20 pounds, goose 15 pounds.	Meat and feathers.	
<b>Toulouse</b>	Blue-gray in color, marked with brown. Head large but short, bill short and stout, neck medium long, body compact, medium length, deep, belly almost touching ground, back broad, slightly arched, breast broad and deep, wings large, strong, close fitting, tail short. Adult gander 20 pounds, goose 18 pounds.	Meat and feathers.	
<b>White and Brown Chinese</b>	Bodies plump and round, covered with coat of soft feathers and fine down. Medium size, mature specimens weighing 10 to 14 pounds. Long arch necks, with large round knob at base of beak. Short erect body and carriage.	Meat and feathers. Much in demand for ornamental purposes.	

## DUCKS AND GEESSE—Continued

BRIEF BREEDING RULES	DISEASES AND SYMPTOMS	TREATMENT	BULLETINS
Set from eggs from vigorous stock having the qualities particularly desired. Eggs should not be more than 1 week old, and must be fresh. For Asiatic breeds, mate 1 male to 10 females; for Americans, 1 male to 8 to 12 females; for Mediterranean, 1 male to 10 to 15 females. In selecting breeding stock, pedigree, appearance, condition and permanence are of first importance in the parents. Strong, constitutional vigor and early maturity essential.	<b>Fowl cholera</b> .—Symptoms: A yellowish discoloration of part of droppings usually white. Fowl becomes unsteady on legs, feathers ruffled, wings droop, head drawn down, comb and wattles pale, legs hot. Food repulsive. <b>Pip</b> .—Symptoms: Mucous membrane of mouth dried and a hard horny scale is formed on end of tongue. The hard scale or "pip" will in time fall off of its own accord. <b>Brood sickness</b> .—Rattling in throat and difficult food breathing.	Use mercury bichloride as on page 409 (contagious diarrhoea). 1 per cent solution carbolic acid in drinking water and cayenne pepper in food are recommended. Treatment seldom satisfactory.  Apply equal parts of glycerine and water freely or wash mouth frequently with a solution of 16 grains boracic acid in 1 ounce of water.  Remove fowl to comfortable fresh-air pen, protected from drafts. Give nourishing, bracing food. Use 12 tablets arsenite of antimony, 0.001 of a grain each, to each pint of drinking water and allow bird no other drink.	See page 409.

BRIEF BREEDING RULES	DISEASES AND SYMPTOMS	TREATMENT	BULLETINS
Select big, strong, vigorous, healthy, well-matured stock, not closely related. Constitutional vigor of first importance. Introduce new blood into flock. Males should be unpaired to females, as inbreeding weakens stock. Medium-sized male with good, fair-sized females of strong constitutional vigor and mature age will give best results. Have 4 or 8 females to 1 male. Hen lays 20 to 40 eggs in a season, beginning March or April. 1 mating sufficient to fertilize entire batch of eggs. Hen will lay 18 to 20 eggs before becoming broody, and if broken up will lay another batch.  Period of incubation 26 to 30 days. Old birds in good condition, not overfat, best breeders. Birds of either sex may be used for breeding until 8 or 10 years old. Laying generally begins in March or April.	<b>Blackhead</b> .—Symptoms: Turkey look pinched, shrunken and purple about head. Feathers rough. Diarrhoea present with bright yellow excrement. Birds have little life and drag about. <b>Colds</b> .—See under chickens. <b>Roup</b> .—See under chickens. <b>Gapes</b> .—See under chickens.  <b>Tapeeworms</b> .—Symptoms: Presence of worms in faeces. <b>Diarrhoea</b> .	Kill and burn affected birds, and thoroughly disinfect coops, buildings, feeding and drinking troughs, etc. Pepper, ginger and something sour in food aid in prevention.  Freshly powdered kumaso, tansy and pumpkins seeds are recommended. Turpentine in small doses has given success.  Mix 3 ounces sulphuric acid and 14 pound copperas in 2 gallons water, and give 1 teaspoonful of mixture in each quart of drinking water.	See chicken references. Farmers' Bulletin No. 200.

BRIEF BREEDING RULES	BEST FOODS	DISEASES AND SYMPTOMS	BULLETINS
Mate only standard specimens. Select meaty birds, deep bodied and strong in bone. Attention must be given to pedigree, appearance, condition and performance. Quick growth is important. Better ducklings result from eggs from old ducks, but young ducks lay a month earlier than old ones, and their eggs may be used for early hatching. Laying period December to June. Usually 1 male to 5 females till June, then 10 females. Birds are kept in flocks of 25 to 40 of both sexes. Laying season extends from January to August.  Period of incubation 25 to 32 days.  Ducks are poor sitters and eggs generally hatched by hen or incubator.  For general breeding notes see chickens.	When breeding birds have free range and water-run, they may be fed either whole corn, wheat, oats or barley, or a mixture. If eggs are desired, supply good beef scrap. The birds may be allowed to help themselves. When confined and heavy egg production desired, soft food should be fed morning and night and a light feed of hard grains in middle of day. Corn meal, low-grade flour, wheat bran, meat scrap and some green food, as turnips, cabbage, oat clover or alfalfa, make a valuable mixture. Drinking water should always be within reach. Begin to feed ducklings when 40 to 48 hours old. Start with mixture of two-thirds wheat bran and one-third corn meal, moistened with water or milk; a raw egg stirred in with each quart of grain is good addition, as is also a little sand or prepared grit. Keep before ducklings for 2 days if it remains sweet. Otherwise reserve. When ducklings 1 week old, they may take 0.05 beef scrap, 3 parts wheat bran, 2 parts corn meal, 4 feedings a day. Gradually increase proportion of corn meal so that at 6 weeks the meal and bran are equal, and the beef scrap 0.15 is of the whole. At 6 weeks feed 3 times daily. If this feed too laxative, reduce the beef scrap. Excess green food likely to make skin yellow. Abundance of grit and fresh water must be constantly available.	Ducks are remarkably free from disease and there are no diseases peculiar to them. Ducks running with other fowls may contract diseases, which should be treated as for other fowls. Lameness may result from damp quarters. Ducks having colic, as shown by frothy scum over eyes, should have eyes washed with warm water containing a little carbolic acid. Treat as for cold.	See chicken references.  Farmers' Bulletin No. 64.

BRIEF BREEDING RULES	BEST FOODS	DISEASES AND SYMPTOMS	BULLETINS
Choose bright, active goose and gander of good parentage, 2 to 3 years old. Mate in fall or early winter. Gander and goose to 4 in number, should be put together and isolated till they become accustomed. Young ganders often take but 1 goose. Hens may be placed on the eggs. Goosess usually lay 2 to 3 eggs. Wild ganders do not mate until 2 to 3 years old, and frequently will not mate first year in captivity. Period of incubation 27 to 33 days.  Laying season is very short, beginning about February 1. Will lay 20 to 50 eggs per year.  Goosess not fully mature until 1 year old, and first year eggs frequently infertile. Best laying is from second year on. Ganders are most valuable at 3 to 7 years. Goosess becomes broody after laying about 18 to 20 eggs. If these taken away and goose shut up for few days she will then lay another batch, and with similar treatment a third batch. Eggs for hatching should be held at 50 to 60 degrees and turned each day. For general breeding notes, see chickens.	Goosess graze freely and in this way pick up much of their food. In winter, supply a little grain and liberal allowance of succulent food, as roots and cabbage. At laying time the feed should be increased. A liberal ration, as prepared for ducks, containing considerable animal food, should be given twice a day.  Water and grit should always be accessible. In finishing grass-fed geese for market, feed corn meal with 10 per cent of beef scrap, scalded or wet with cold water. Once a day give whole corn.  Keep geosings in warm place, and first 2 or 3 days feed little soaked bread and water. Gradually let them out, and in a week they may go free. Will need nothing but a little stale bread first 5 weeks, if on good free range. After 5 weeks mash of one-third corn meal, two-thirds bran should be given. After 6 weeks give equal parts of corn and bran, to fatten.	Goosess are almost wholly free from disease, and the gander is seldom troubled in this respect.	See chicken references.  Farmers' Bulletin No. 64.

## THE AGRICULTURAL EXPERIMENT STATIONS

The most prolific source of agricultural literature is the United States Department of Agriculture, Washington, D. C. This department maintains various bureaus and laboratories, in charge of eminent specialists, who investigate and report upon almost every phase of agriculture, horticulture and animal husbandry. For location of Agricultural Colleges and State Universities, see page 76.

**Alabama—**

COLLEGE STATION, Auburn.  
CANEBRAKE STATION, Uniontown.  
TUSKEGEE STATION, Tuskegee.

**Alaska—** Sitka.**Arizona—** Tucson.**Arkansas—** Fayetteville.**California—** Berkeley.**Colorado—** Fort Collins.**Connecticut—**

STATE STATION, New Haven.  
STORRS STATION, Storrs.

**Delaware—** Newark.**Florida—** Gainesville.**Georgia—** Experiment Station.**Guam—** Island of Guam.**Hawaii—**

FEDERAL STATION, Honolulu.  
SUGAR PLANTERS' STATION, Honolulu.

**Idaho—** Moscow.**Illinois—** Urbana.**Indiana—** Lafayette.**Iowa—** Ames.**Kansas—** Manhattan.**Kentucky—** Lexington.**Louisiana—**

STATE STATION, Baton Rouge.  
SUGAR STATION, Audubon Park, New Orleans.  
NORTH LOUISIANA STATION, Calhoun.  
RICE STATION, Crowley.

**Maine—** Orono.**Maryland—** College Park.**Massachusetts—** Amherst.**Michigan—** East Lansing.**Minnesota—** University Farm, St. Paul.**Mississippi—** Agricultural College, Starksville.**Missouri—**

COLLEGE STATION, Columbia.  
FRUIT STATION, Mountain Grove.

**Montana—** Bozeman.**Nebraska—** Lincoln.**Nevada—** Reno.**New Hampshire—** Durham.**New Jersey—** New Brunswick.**New Mexico—** Agricultural College.**New York—**

STATE STATION, Geneva.  
CORNELL STATION, Ithaca.

**North Carolina—**

COLLEGE STATION, West Raleigh.  
STATE STATION, Raleigh.

**North Dakota—** Agricultural College.**Ohio—** Wooster.**Oklahoma—** Stillwater.**Oregon—** Corvallis.**Pennsylvania—**

STATE COLLEGE, Pa.  
STATE COLLEGE, Institute of Animal Nutrition.

**Porto Rico—** Mayaguez.**Rhode Island—** Kingston.**South Carolina—** Clemson College.**South Dakota—** Brookings.**Tennessee—** Knoxville.**Texas—** College Station.**Utah—** Logan.**Vermont—** Burlington.**Virginia—**

BLACKSBURG.  
NORFOLK, Truck Station.

**Washington—** Pullman.**West Virginia—** Morgantown.**Wisconsin—** Madison.**Wyoming—** Laramie.

**HORTICULTURE** is the growing and cultivating of fruits, vegetables, flowers and ornamental plants, as shrubs and others. It is divided under four general heads by authorities, viz.:

*Pomology*, or fruit growing.  
*Olericulture*, or vegetable growing.  
*Floriculture*, or the growing of flowers and plants for various purposes.

**Landscape gardening.**

The first two have the wider economic importance. Improved transportation facilities, fast freight lines with refrigerator cars, organized systems of gathering, shipping and marketing, and a better general and specific knowledge of climates and soils best adapted to each particular product have stimulated horticulture in all its branches.

According to the census of 1900 fruits in the United States aggregated in value nearly \$131,500,000, of which those of the orchards proper contributed \$83,752,000, grapes over \$14,000,000, small fruits \$25,000,000, and subtropical fruits \$5,550,000. Of this total California was credited with 21.5 per cent, New York 12.1 per cent, Pennsylvania 7.5 per cent, Ohio 6.8 per cent, and Michigan 4.5 per cent, the aggregate for these five states amounting to over 52 per cent of the total for the United States.

Many other states include favored localities where fruits of the finest quality are grown.

Spraying as a means of protecting fruits and fruit trees, shrubs and vines from injury by insects and fungi, is generally regarded as essential, not only in preventing loss of fruit but in aiding its more perfect development. Also, it has been demonstrated in some districts noted for the excellence of their fruits that damage by unseasonable frosts may be successfully guarded against by use of smudge pots, or heaters, in which oil or some other material is burned, and by which atmos-

pheric conditions are made such as to prevent destruction of the fruit buds by cold. Bee-keeping goes hand in hand with fruit-raising, and the bees are helpful in promoting perfect pollination in the blossoms which they visit.

**ANIMAL HUSBANDRY**, or the rearing of livestock, is important, if not indispensable to a prosperous and permanent agriculture. Farm animals not only provide meat and milk, which constitute leading industries in themselves, but, through the wise use of their manures, vitally aid in maintaining the fertility of the land. As agriculture grows in intensity the values of manures increase; in Germany, for instance, it is a common custom to measure the peasant's prosperity by the size of his manure heap. Under right management, it should be infinitely more profitable, too, to market the bulk of the farm crops in the form of beef, mutton, pork, products of the cow and poultry, than to sell the crops direct. In the latter case all the fertility they contain goes with them, resulting in a net loss to the land of just that much plant food. Persevered in, such a system leads to impoverished soils and poverty. Besides, stock-keeping affords continuous employment for labor.

**Select Breeding.**—All domesticated animals have been greatly improved by judicious selection, mating and feeding, and the better sorts are always found where civilization is most advanced. In America, the pure-bred and high-grade are gradually taking the place of the "scrub" or mongrel. The former are not only kept more economically, but mature earlier, and can be reliably depended upon to return largest profits. The selection of a breed should depend upon the individual, his needs, environments and location, and by all means, for any purpose, be of improved stock and superior individuals.

**Dairying.**—No other form of husbandry

is more highly profitable, or contributes more to maintaining or building up soils than dairying. In recent years its progress and growth throughout the United States and Canada have been most marked, resulting incidentally in many immense butter factories, called creameries, some of which gather their milk and cream from a wide territory, and for which special milk trains are run. Butter and cheese making away from the farms have become special industries representing large capital, under the management of trained specialists.

**Important Aids.**—Inventive genius has been of incalculable aid to dairying. In comparatively recent years have come the Babcock test, and the cream separator. The test is used in ascertaining the per cent of fat in milk, and, with the scales, enables the detection of profitable and unprofitable cows. The separators extract the fat from milk by centrifugal force, as soon as drawn from the cow, obtaining a larger percentage of the butter-fat or cream than is possible by gravity, and leaving the milk at once available and sweet as a much esteemed food for young farm animals.

The many well-to-do communities where dairying is a leading industry prove that, wisely conducted, it yields a higher prosperity than general farming.

**Veterinary Science** has kept pace with and contributed to the general advance in animal husbandry. The tuberculin test, for detecting tuberculosis in cattle, is one of the valuable late discoveries, and another is the successful treatment of milk fever in cows. By inoculation and disinfection it is had from "Spanish" or "Texas" fever in cattle, and the latest discovery, and one promising incalculable value to the swine industry, is that by which hogs may be made immune from "cholera" through inoculation, which annually destroys vast numbers.



1 English Spaniel,  
2 Point Dog,  
3 Newfound-  
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5 Fox-  
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7 St. Bernard,  
8 Russian Hound,  
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10 Maltese Spaniel,  
11 King Charles Spaniel,  
12 Scotch Collie,  
13 Fox Terrier,  
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**MANUFACTURES.**—At the time the American colonies were founded the industries of the world were largely conducted under the domestic system of labor. The colonists were without capital and there was very little opportunity for specialization in manufacture. Each family was largely dependent upon its own exertions for the production of food and clothing, as well as for the ordinary domestic utensils and implements of agriculture. Building materials were unknown, except as they were obtained from the forest or the quarry.

**Early Basic Industries.**—The basic industries of the country, nevertheless, had an early start and naturally continued to develop with the increase in population.

**Textile Industries.**—Until after the Revolution, and even as late as 1840, hand spinning and weaving and the domestic manufacture of coarse cloths was largely practiced throughout the country. The tendency was constantly toward the factory method of manufacture, and a little fulling-mill was built at Rowley, Mass., in 1643, which was probably the first textile mill erected in this country. The first cotton factory for the employment of English methods was built in 1790 at Pawtucket, R. I. A cotton mill operated by horsepower was built on James Island near Charleston, S. C., in 1787. About the same time other textile mills were put into operation in Philadelphia and in the Southern States.

**Shipbuilding.**—The unlimited forests were an inducement to shipbuilding, and this was the first industry in which cooperative labor was employed. The *Restless*, built in 1614, was probably the first vessel with a deck built in this country. The industry developed with the increase in population, and by 1700 extended from the northward to the southern colonies. In 1769 the annual product amounted to not less than 389 vessels, with an aggregate of 20,000 tons burden.

**Lumber.**—The first sawmill in the New England States was built in 1633 or 1634. Saw and grist mills were located on streams wherever there was sufficient population to support them. They were the first industries to utilize the water power of the country.

**Building Materials.**—The first brick were made in Virginia in 1629. Rough logs and hewn timber were the universal building materials outside of the larger settlements, but the product of the sawmills was used for building at an early date. As early as 1770 considerable quantities of lumber were exported.

**Metal Industries.**—Iron was the only base metal produced in the early history of the colonies. The precious metals were found in small quantities, but never enough to be of commercial importance. The first forge was set up in Massachusetts, probably at Lynn or Braintree, in 1643 or 1644. Iron works, bloomeries and forges, and mills for the manufacture of articles from the metal were erected at various points where the ore was discovered. In 1619 there was an attempt made in Virginia to manufacture iron. Later the iron deposits were discovered in Pennsylvania, where forges and furnaces were built as early as 1700. In 1731, when the returns of the manufacturers were made by the governor in pursuance of an order of the House of Commons, New England was reported to have six furnaces, eighteen forges, one slitting mill, and a nail factory. The industry was insignificant as compared with the great blast furnaces and rolling mills and steel

works in operation 200 years later (1904), when more than 250,000 persons were employed, and the annual products were valued at \$906,000,000.

**Leather.**—Tanning, as one of the simplest of the arts and a support of the stock husbandry, was commenced almost with the first settlement. The tanning of leather and the manufacture of boots and shoes were of commercial importance at Lynn, Mass., as early as 1650. In 1640 laws were enacted providing for the preservation of the hides of animals to be tanned for leather, and evidently the shoe industry was of considerable importance then. Eastern Massachusetts has continued to be the principal boot and shoe producing district of the country. The products of the factories in the two cities of Brockton and Lynn during 1904 were valued at more than \$55,000,000 and formed about 17 per cent of the total for the United States, which was reported as \$320,000,000.

**Causes of Development.**—The various Indian wars of the colonial period, the war of the Revolution, as well as all subsequent wars, have stimulated the industrial development. Those in the early history of the country forced the planting of the mechanical arts, and an unprecedented development commenced immediately after the Civil War.

The ingenuity of the people, unlimited natural resources, the system of laws, free intercourse between the States, and improved methods of transportation have, combined with the various other conditions, caused a rapid and unprecedented increase in the manufactures of the United States. No other nation has such a record of development.

**Materials.**—The raw materials used in manufacture are obtained either from the farm, the forest, the mine, or the sea. During 1904 those obtained from the farm were reported as costing \$2,492,836,646; those from the forest, \$163,464,577; those from the mine \$471,118,181; and those from the sea, lakes and rivers, \$13,715,086.

**Principal Industries.**—The manufacture of food products, structural and building materials, and clothing and kindred products are by far the most important industries of the country.

**Animal and Fish Products.**—The manufacture of canned goods was comparatively unimportant prior to 1890. Since then it has had a wonderful development, and a great variety of foods preserved in metal or glass receptacles are now manufactured from animal and fish products. In 1904 there were 10,647 establishments with an annual product of \$1,139,557,178. This includes the slaughtering industry and the manufacture of the various animal products, cheese, butter, condensed milk, and the canning and preserving of sea foods. It also includes the by-products, such as fertilizers, containers, etc., which are of great importance in some establishments. Measured by the gross annual value of products (\$913,914,624), slaughtering and meat packing is the most important single industry of the United States. This is the product of the wholesale establishments only. The retail butchers and farmers slaughter an enormous number of which no record is preserved.

**Butter and Cheese.**—These products are manufactured on farms even more extensively than in independent establishments. In 1900 the production of butter on farms amounted to 1,071,745,127 pounds and in factories to 531,478,141 pounds. But this enormous total of 1,603,223,268 pounds

does not represent the total production, as it is estimated that 40,000 pounds of butter was made by persons having one or two cows, but who were not classed as farmers.

**Vegetable Products.**—The different varieties of food products are now practically unlimited, new forms of tasty preparations constantly appearing in the market. Including the flour mills and the bakeries there were 38,055 establishments reported as engaged in the manufacture of these commodities from vegetable products during 1904, and their annual product was valued at \$217,693,177. This value includes by-products, such as cattle feed, fertilizers, etc., which are not used for food. Flour mills, breweries, sugar refineries, bread and other bakery products are, in the order named, the four most important industries using vegetables or cereals.

**Flour Mills.**—Flour is the most important product for human consumption as a raw material. The annual production of wheat flour exceeds 110,000,000 barrels.

**Bakeries.**—Such a large quantity of flour is consumed annually in domestic use that the operations of the 18,227 establishments reported as engaged in the manufacture of bread and bakery products during 1904 is no indication of the actual consumption. The products of these establishments amounted to \$269,609,061.

**Sugar.**—Sugar cane was first brought to Louisiana in 1751 and the first sugar was manufactured in 1791. The industry has had a wonderful development, but the domestic production has never been sufficient to supply the consumption in the United States. The products of the refineries for 1904 amounted to \$277,285,449, which includes a considerable amount of by-products. The production has increased from 274,724,000 pounds in 1860-1 to \$28,800,000 in 1908-9.

**Beet Sugar.**—The manufacture of sugar from beets assumed considerable proportions prior to 1870. The production for that year was about 896,000 pounds. There has been a steady increase from year to year, the product for 1909 amounting to 851,768,000 pounds.

**Liquors.**—A considerable proportion of the revenue of the federal government is derived from a tax on the production and sale of distilled and fermented liquors. The production is carefully gauged. The production of distilled liquors, exclusive of fruit brandies, increased from 109,275,928 tax gallons in 1890 to 133,450,755 gallons in 1909. The production of fruit brandies increased from 1,825,810 gallons in 1890 to 6,440,858 gallons in 1909, and of fermented liquors from 27,561,944 barrels in 1890 to 56,364,360 barrels in 1909.

**Confectionery.**—Candy making as an art did not obtain a firm footing in this country until about the middle of the last century, but as early as 1816 there were twenty confectioneries manufacturing candy in Philadelphia. The products are made so largely in small shops, bakeries, and restaurants that no correct figures can be compiled. During 1904, however, there were 1,348 establishments with an annual product of \$87,087,253 which made a specialty of these products.

**Glucose.**—This product is used largely in the manufacture of confectionery as a substitute or adulterant for sugar. Prior to 1870 there was very little, if any, manufactured in this country, but during 1904 the product was valued at \$12,207,197.

**Manufactured Ice.**—In 1880 there were about thirty-five establishments in the country

manufacturing ice for sale. Since 1890 the industry has increased very rapidly, especially in the Southern states, where it is difficult, or impossible, to obtain the natural product. There were 1,320 establishments in operation during 1904 and their annual product was valued at \$23,790,045. In addition, enormous quantities are manufactured by brewers, markets, and cold storage companies and consumed in the establishment where produced.

**Textiles.**—These industries include the manufacture of fabric from either vegetable or animal fibers. The processes of manufacture are complicated and require large investments in machinery. A larger quantity of cotton is consumed than of all the other fibers combined. The consumption for the entire world in 1908 shows that about 54 per cent of the quantity was cotton, 14.5 per cent wool, 14 per cent jute, 10 per cent flax, 7 per cent hemp, and 0.5 per cent silk.

**Cotton Mills.**—In 1850 there were 1,094 establishments with an annual product of \$4,734,424. In 1904 there were 1,154 establishments manufacturing cotton goods, and cotton small wares and their products for the year were valued at \$450,467,704.

**Wool Manufactures.**—The product of the 675 establishments reported for this industry in 1850 amounted to \$48,608,770. There were 1,213 establishments in 1904 engaged in the manufacture of woolen and worsted goods, carpets and rugs, felt goods, wool hats and, similar products in which wool in some form was the chief component material. The annual product of these mills was valued at \$380,934,003.

**Hosiery and Knit Goods.**—The variety of products has increased with the application of new inventions, and since 1850 the industry has advanced more than five fold. There were 1,079 establishments in operation during 1904 and their products were valued at \$136,558,139.

**Spindles and Looms.**—The spindle is used in the majority of the textile mills irrespective of the character of the fiber consumed. In 1870 there were 9,344,418 spindles and 204,954 looms in operation. By 1904 the number of spindles had increased to 30,351,703 and the number of power and hand looms to 697,789.

**Clothing and Kindred Products.**—The manufacture of men's and boy's wearing apparel for sale, ready made, is a branch of industry established during the decade ending 1860. Since then it has been greatly expanded and specialized. It now covers practically every article of clothing worn by the old and young of both sexes. Considering the industry in this broad sense, there were 15,952 establishments engaged in it during 1904 and their products were valued at \$1,496,133,850. Of the various classes of manufacture included in this aggregate the most important are men's and women's exterior clothing, hosiery and knit goods, and boots and shoes.

**Iron and Steel Products.**—The manufacture of pig iron is the foundation of all industries in this group. The production has increased from 563,755 long tons in 1850 to 25,795,471 tons in 1909.

**Rolling Mills and Steel Works.**—The larger portion of the products of the blast furnaces was consumed as material in these works and their products were in turn consumed in part by the foundries and machine shops of the country. There were 415 steel works and rolling mills in operation during 1904 and their products were valued at \$673,965,026. In the early days of the industry these works made only the heavier

partially manufactured products, such as nail and boiler plate, rods, ingots, etc. Finished products, such as wire, wire nails, bolts, nuts, rivets, pipe, tubes, horseshoes, springs, stamped ware, structural iron, rails, etc., are now frequently manufactured in the establishment where the metal is produced. The annual production of steel ingots and castings increased from 4,412,032 gross tons in 1894 to 14,023,247 in 1908.

**Wood Industries.**—The sawmill is the basic industry for these products. There were 31,231 mills in operation during 1908 producing rough lumber, lath or shingles and kindred products. The production of lumber amounted to 33,224,396,000 feet board measure and there were 2,986,054,000 lath and 22,106,483,000 shingles manufactured. Wood is used as material, either alone or associated with other products, in such a great number of industries that it is impossible to measure its relative importance. Those industries in which it was the principal material reported a gross product for 1904 amounting to \$1,223,730,336. The New England states were originally the principal lumber producing section. With the depletion of the forests the center of the industry shifted to the north Central states, then to the Pacific coast and the Southern states. Washington and Louisiana are now the two principal lumber producing states, the production for 1908 amounting to 2,915,928,000 and 2,722,421,000 feet board measure respectively.

**Power and Machinery.**—The almost universal adaptation of machinery to all lines of manufacture has been one of the most important factors in the industrial development of the United States. The use of machinery was greatly stimulated by the invention of cotton spinning machinery in 1870, the power loom in 1785, the cotton gin in 1794, Bessemer process of steel making in 1856, the sewing machine in 1845, the gas engine, which was first used about 1800. Machines for the manufacture of brick were also invented in 1800.

**Steam Power.**—The invention of the steam engine in 1773 diverted attention from water power, which at that time was in universal use. Mills could be built in cities where operatives could be supplied. By 1870 steam power employed in the manufacturing establishments had increased to 1,215,711 horsepower. In 1904 there was 11,117,625 horsepower reported for the steam engines, including gas and internal combustion engines, employed in manufactures. The largest increase occurred during the decade ending with 1900.

**Water Power.**—In 1870 the water wheels in manufacturing establishments were capable of developing 1,130,431 horsepower, or almost half of the power used in such establishments. The quantity has not increased as rapidly as steam power. By 1904 it amounted to 1,647,969 horsepower, and formed only 11 per cent of the total power employed. Water power is now used largely to develop electric power, and the water wheels used for that purpose during 1907 were reported as having 1,441,000 horsepower.

**Electric Power.**—This kind of power was first employed in manufacturing establishments during the decade ending with 1890. By 1900 the electric motors used for this purpose had 310,661 horsepower and by 1904 it had increased to 1,150,891 horsepower, forming about 11 per cent of the total power. The establishment of large hydro-electric plants which furnish electricity for every conceivable purpose, is stimulating its use in manufactures, where it is now of greater importance than the direct application of water power.

**Manufacturing Zones.**—In 1850 the center of manufacturing was in western Pennsylvania. From decade to decade it has moved steadily westward on about the same degree of latitude and is now about the center of Ohio. The manufactures of the large cities of the middle west have increased rapidly and their importance has tended to pull the center away from the Eastern states, where industries were first developed.

**Most Important Area.**—The heaviest area of manufactures is in the southern New England states, southern New York, New Jersey, and eastern Pennsylvania. Manufactures are extensive and fairly heavy over a much larger area, namely, that north of the Potomac and the Ohio and east of the Mississippi rivers; in this section they have increased very rapidly during the past twenty years.

**Principal Centers.**—New York, Philadelphia, and Boston were for many years the principal manufacturing cities. Chicago now outranks Philadelphia, and St. Louis outranks Boston. During recent years manufactures have developed so rapidly in the suburbs of the cities that the establishments located within the corporate limits of the cities are no longer a true indication of the importance of the industrial community. The establishments in the immediate neighborhood of the city should be considered as forming a part of its industries. The following table gives the statistics for ten of the principal industrial districts of the United States.

THE TEN PRINCIPAL INDUSTRIAL DISTRICTS

DISTRICT	NUMBER OF ESTABLISHMENTS	NUMBER OF EMPLOYEES	SALARIES AND WAGES FOR YEAR	GROSS VALUE OF PRODUCTS	AREA (sq. mi.)
New York . . .	25,257	735,460	\$430,238,272	\$2,144,488,093	702
Chicago . . . .	8,382	288,809	180,673,672	970,974,280	500
Philadelphia . .	7,780	286,944	151,923,857	677,781,117	501
Boston . . . . .	4,870	177,157	102,501,692	457,254,360	502
Pittsburgh . . .	1,859	119,839	77,339,055	383,490,468	198
St. Louis . . . .	2,603	104,097	61,913,138	319,709,899	206
Baltimore . . .	2,243	78,729	36,651,368	202,659,272	246
Cincinnati . . .	2,600	82,590	44,862,069	203,095,605	151
Cleveland . . . .	1,720	75,142	44,216,685	179,184,277	201
Buffalo . . . . .	1,631	54,648	31,072,320	108,111,658	200

**Large Establishments.**—Large industrial enterprises have developed very rapidly during the past twenty years. One of the

most effective methods of forming these enterprises is to consolidate independent establishments. During 1904 there

were 1900 establishments that reported an annual product in excess of \$1,000,000 and many of these were operated under the same ownership. Their combined product formed 38 per cent of the total product reported for all establishments. There were 34,181 establishments that had an annual product in excess of \$100,000, and their combined product formed 79 per cent of the total for all.

The large establishments are of greatest importance in petroleum refining, slaughtering and meat packing, iron and steel works, tobacco manufacture, and also in the manufacture of electrical machinery and of cotton goods.

**United States Compared With Other Nations.**—In 1880 the United States was given fourth place in respect to the value of manufactures produced, and was conceded the first place in 1894. By some authorities it was given the first place as early as 1885. The United Kingdom is given the second place, Germany the third, and France the fourth. Germany has made greater relative progress during the

past twenty-five years than has either England or France.

The supremacy of the United States as a manufacturing nation may be attributed to several causes, but none has a more stimulating effect than the possession of a home market, untrammelled by local conditions and protected from foreign competitors. American manufacturers practically supply the needs of a population double that of the United Kingdom, more than double that of France, and nearly a third again as numerous as the population of the German empire, and in addition export domestic manufactures valued at more than a billion and a half of dollars.

**Iron and Steel in Other Nations.**—The manufacture of iron and steel is the most significant indication of a nation's progress.

The United States is by far the greatest iron and steel producing nation. Textiles in Other Nations.—The United Kingdom is the greatest producer of textiles, but it does not have the undisputed control that it enjoyed during the first half of the nineteenth century. Both the

United States and Germany are active and often successful competitors. In 1909 there were 53,312,000 cotton spindles in the United Kingdom as compared with 28,018,000 in the United States and 10,163,000 in Germany.

**MINES AND MINING.**—The two basal industries upon which all others depend are agriculture and mining. Manufactures of every kind, trade, transportation—all industry—must cease when the farms and the mines fail to bring forth their increase. When the two basal industries are measured by the value of their annual products that of mining appears of comparative insignificance. In 1908, for instance, the gross value of the agricultural products is estimated at \$7,871,000,000, while in 1907, the year of maximum activity in the mining industry, the value of the mineral products exceeded \$2,000,000,000 for the first and only time in our history.

**Principal Mining Countries.**—The United States leads the world in the production of most of the important mineral substances.

TABLE 1. PRODUCTION OF THE PRINCIPAL MINERALS AND METALS BY THE LEADING COUNTRIES OF THE WORLD

1906	COAL Short Tons	IRON ORES Long Tons	GOLD Value	SILVER Value	COPPER Pounds	LEAD Short Tons	ZINC Short Tons	PETROLEUM Barrels	CEMENT Barrels	SALT Barrels
United States.....	415,842,698	35,963,336	\$4,640,000	\$28,050,000	942,570,721	310,762	190,749	179,572,479	52,910,923	28,382,062
Great Britain.....	252,429,722	510,266	10,000	7,300	1,295,052	33,120	6,430	25,087,850	14,747,514	14,747,514
Germany.....	237,245,556	7,402,210	64,800	2,859,300	50,229,160	181,167	225,948	1,009,278	See Note	18,652,883
Austria-Hungary.....	85,960,776	2,144,105	2,469,300	947,000	3,508,768	16,118	9,335	12,012,295	See Note	4,814,421
France.....	11,197,591	3,984,054	835,400	428,300	92,896	27,600	1,232	66,936,934	8,688,150	8,688,150
Belgium.....	26,960,805	76,361	28,052,200	70,700	37,137,400	110	8740	62,186,447	.....	14,741,750
Russia.....	27,618,128	3,180,564	2,469,300	947,000	3,508,768	16,118	9,335	12,012,295	See Note	4,814,421
Japan.....	16,337,311	60,843	10,998,500	72,377,200	91,243,396	33,112	2,074	2,074,929	.....	4,902,850
India.....	14,301,991	.....	.....	.....	.....	.....	.....	5,047,038	.....	.....
Australia and New Zealand.....	11,413,654	36,046	.....	9,187,000	84,236,880	131,376	128,683	.....	.....	599,828
Spain.....	4,838,340	10,384,183	2,233,600	2,233,600	117,790,400	202,253	172,169	.....	.....	6,990,807
Mexico.....	1,129,086	.....	22,371,200	39,402,900	96,843,760	121,440	6,466	3,491,410	.....	86,565

Note.—Germany, Austria-Hungary, Russia, and other European countries are manufacturers of Portland cement but statistics are not available.

The accompanying table I. shows the principal mineral products of the leading producing countries for the latest years that statistics are available. The United States produces nearly 40 per cent of the world's supply of coal, 63 per cent of the petroleum, 40 per cent of the iron ore, nearly 60 per cent of the copper, 30 per cent of the lead and zinc, 21 per cent of the gold and 25 per cent of the silver.

**Fuel.**—Coal is not only the principal mineral product, but it furnishes 60 per cent of the tonnage hauled by the transportation companies and nearly all the power. There are six grand divisions or provinces into which the coal-producing areas are divided, as follows:

**The Eastern Province,** which includes all of the bituminous area of the Appalachian region; the Atlantic coast region, which includes the Triassic fields near Richmond and the Deep and Dan river fields of North Carolina, and also the anthracite region of Pennsylvania.

**The Gulf Province,** which includes the lignite fields of Alabama, Mississippi, Louisiana, Arkansas and Texas.

**The Interior Province,** which includes all the bituminous areas of the Mississippi valley region and the coal fields of Michigan. This province is subdivided into the eastern region, which embraces the coal fields of Illinois, Indiana and western Kentucky; the western region, which includes the fields of Iowa, Missouri, Nebraska, Kansas, Arkansas and Oklahoma; and the southwestern region, which includes the coal fields of Texas. The Michigan fields

are designated as the northern region of the interior province.

**The Northern (or Great Plains) Province,** which includes the lignite areas of North and South Dakota and the bituminous and subbituminous areas of north-eastern Wyoming and of northern and eastern Montana.

**The Rocky Mountain Province,** which includes the coal fields of the portions of Montana and Wyoming which are in the mountainous districts of those states, and all the coal fields of Utah, Colorado and New Mexico.

**The Pacific Coast Province,** which includes all of the coal fields of California, Oregon and Washington.

**Production and Quality.**—In point of production and in the quality of the coals the Appalachian region of the eastern province is by far the most important.

It extends from Pennsylvania on the north to Alabama on the south and includes, besides the anthracite region of Pennsylvania, the high-grade coking coals of the Connellsville district of Pennsylvania, the Pocahontas and New river districts of West Virginia, and the Warrior district of Alabama; the famous steam and gas coals of the Pittsburgh district in Pennsylvania and of Fairmont and other districts in northern West Virginia; the unrivaled smithing coal of the George's creek region in Maryland and Elk Garden in West Virginia, the Kanawha (W. Va.) gas coals and the Jellico steam and domestic coal of eastern Kentucky and Tennessee.

The coals of the interior province are for the most part noncoking, but possess good steaming qualities and are good domestic fuels.

Those of the great plains and Rocky mountains range from lignite to bituminous, with small areas of anthracite. Some of the bituminous coals in the Rocky mountain areas possess good coking quality.

The principal coal deposits of the Pacific coast are in Washington and Alaska, though the latter have not been developed. **Pennsylvania** is by far the most important contributor to the coal supply, its combined production of anthracite and bituminous coal being equal to that of all the other states taken together, and in the possession of its supply of anthracite Pennsylvania stands alone. Small areas of anthracite are found in the Rocky mountains, but the production is and always will be insignificant as compared with the Pennsylvania product.

**Illinois** ranks second, closely followed by West Virginia.

**Ohio** is the fourth in rank, followed in order by Alabama, Indiana, Colorado and Kentucky. No other state produced as much as 10,000,000 tons, and it will be noted that all of these with one exception, Colorado, are east of the Mississippi river.

**Petroleum and Natural Gas.**—The Appalachian region was formerly the center of the petroleum industry, and Pennsylvania, Ohio and West Virginia were the leading producers. These fields are now on the decline and the development has followed the star of empire to the west.



The contestants for first place in the production of petroleum are Oklahoma and California. Illinois ranks third. All of these developments in California and in Oklahoma have been in the last six years, neither state prior to 1904 having a production of any importance. Illinois has no importance as a petroleum producer prior to 1906. The Gulf states of Louisiana and Texas have also become important producers in the last decade and the possibilities of future development are exceptionally good.

The principal gas-producing states are Pennsylvania, West Virginia, Ohio, Kansas, Indiana and New York in the order named.

**Metals.—Gold.**—From the time of Solomon, "the accursed thirst for gold" has led the adventurous portion of the human race into the wilderness and the desert, has made them brave the frozen north and the heat of the tropics. The search for gold more than anything else led to the "winning of the west" and the development of the Rocky mountain and Pacific coast states. It is now conquering the territory of Alaska.

The states east of the Mississippi river lead in the production of coal and of iron and in the manufacturing industries. The states west of that dividing stream are the leading producers of the precious and semiprecious metals. The eastern states that produce gold are Alabama, Georgia, New Hampshire, North Carolina, South Carolina, Tennessee and Virginia, but none of them yields as much as \$100,000 a year.

The distinction of leader in the production of gold belongs to Colorado. Alaska comes second, with California a close rival. Nevada, whose prominence fell with the exhaustion of the Comstock lode, has again come to the front with the developments at Bullfrog, Goldfield, Ely and Tonopah and now ranks fourth. The other important producing states are South Dakota, Utah, Montana, Arizona, Idaho and Oregon.

**Silver.**—The same states are for the most part, also, the principal producers of silver, though not occupying the same relative positions. A notable exception to the rule is Alaska, whose silver output is inconsiderable. The leading states in the production of the white metal are Montana, Colorado, Nevada, Utah, Idaho, Arizona and California.

**Copper.**—Only two of the eastern states have any prominence as producers of copper. Michigan, which ranks third among the copper-producing states, owes its importance to the deposits of ore containing copper as a native metal and commonly known as "lake" copper. It is considered superior in quality to all other grades and usually commands a premium of  $\frac{1}{4}$ ¢ per pound. Tennessee ranks sixth among the copper producers, but yields less than 10 per cent of the output of Michigan. The production of Tennessee is principally from Ducktown, in the southeastern part of the state.

Three states produce 80 per cent of the entire yield of copper—Arizona, from four principal districts, Bisbee, Globe, Jerome, Clifton-Morenci; Montana from the Butte district; and Michigan from the "lake" or Houghton district. The other important producers are Utah, California, Tennessee, Colorado and Nevada.

**Lead.**—The production of lead comes from two principal sources:

1. The Mississippi valley region, where it is largely associated with zinc, but the character of the ore is such that it can be separated mechanically before smelting.

2. The Rocky mountain region, where the lead is in combination with silver and has to be separated by refining after smelting into base bullion.

Missouri is the principal producer of lead, the product coming partly from the Joplin lead-zinc district in the southwestern part of the state and partly from what is known as the "disseminated" lead district in the southeastern part of the state. Missouri produced in 1908 about 40 per cent of the total output. Wisconsin, Kansas and Illinois are also producers of lead-zinc ores.

The lead produced in the Mississippi valley states is known as "soft lead"; that which is obtained from the smelting and refining and silver-lead ores is known as "desilverized lead." The principal producer of the latter is the *Cœur d'Alene* district of Idaho. Utah, the third in importance, obtains its lead chiefly from the Park City, Tintic and Bingham districts. Colorado ranks fourth. No other state produced as much as 10,000 tons.

**Zinc.**—Missouri, in zinc production, as in that of lead, ranks first, the output being from the Joplin-Webb City district. The production for the state in 1908 was practically two-thirds of the total output.

Colorado is second in rank with a production of 20 per cent of that of Missouri, most of which was from Lake county. Then come Wisconsin, Kansas and New Jersey, in the order named. The New Jersey product is from a complicated ore found at Franklin, in Sussex county, and known as Franklinite. Virginia was at one time an important producer of a peculiarly pure zinc from carbonate and silicate ores at Bertha, but the deposits have been exhausted.

**Quicksilver.**—The principal sources of quicksilver in the United States are California and Texas. The industry is on the decline, the introduction of the chlorination and cyaniding process for the treatment of gold ores having largely reduced the demand for quicksilver for amalgamation, its principal use.

**Aluminum.**—Quite the reverse from quicksilver, the uses for and production of aluminum, "the new metal," are growing rapidly, one of the most recent applications being in the construction of automobiles, for which its lightness and strength give it special desirability. The production is controlled in the United States by one company, which owns the principal patents, and exact statistics are not available.

All clays are ores of aluminum, being silicates of the metal, but its extraction from them is an expensive chemical process and not practical for industrial purposes. The ore from which the metal is obtained by electrolytic reduction is bauxite, an oxide of the metal. The known workable deposits are in Alabama, Georgia and Arkansas.

**Iron Ores.**—Iron ores are abundantly distributed, but vary widely in the size of the ore bodies and the quality of the ores. The deposits may be divided into three great districts—the eastern, central, and western.

The *Eastern District* comprises all the Appalachian states from New York to Alabama.

The *Central District* includes the great deposits of the Lake Superior region,

Michigan, Minnesota and Wisconsin, and less important areas in Illinois, Iowa, Missouri and Texas.

The *Western District* includes the Rocky mountain and Pacific coast states.

The principal source of supply at the present time is the Lake Superior region, the three states of Minnesota, Michigan and Wisconsin contributing 80 per cent of the ores that feed the blast furnaces of the United States. Minnesota alone produces over 50 per cent of the total.

**Platinum, Nickel and Cobalt.**—The deposits of these metals are not of economic importance in the United States. Some platinum is recovered in the refining of placer gold and a small quantity is obtained from the black sands of the Pacific coast.

The principal source of supply is the Ural mountains in Russia. Small quantities of nickel and cobalt (the two metals being usually associated) were formerly produced at Lancaster Gap, Pa., Mine La Motte, Mo., and Riddles, Ore., but the United States depends for its present supply on the deposits of Sudbury, Ont.

**Structural Materials.**—The most generally distributed of the mineral substances are those used chiefly for the construction of buildings, the clays and the building stones. Some kind of clay is produced in every state and territory, and there is no state or territory in which stone suitable for building purposes is not available.

The development of these industries, and particularly the manufacture of common brick, while not contributing so largely to the value of the mineral product, indicate the healthful growth of the social fabric in the building up of desirable and permanent communities.

**Clay.**—New York, Illinois, Pennsylvania and Ohio are the leading states in the manufacture of common brick, though because of the development of potteries and other clay-working arts Ohio ranks first in total value of clay products, with Pennsylvania second, Illinois third and New York fourth.

**Stone.**—The principal varieties of stone used for building purposes are granite, sandstone, limestone and marble. The first three are of general distribution, though the quarrying industry has not been by any means equally developed in the different sections.

**Granite.**—The principal development of the granite quarrying industry has been in New England, Vermont, Maine and Massachusetts being the three leading states. From New England a jump is made to California for the fourth in rank, and then for the fifth another jump is made to Wisconsin. Other important producing states are, in order, Georgia, Washington, New Hampshire, North Carolina, Maryland, Minnesota, Connecticut and Rhode Island, three of these being in New England.

**Sandstone.**—The principal producers of sandstone are New York, Pennsylvania and Ohio, the two former including a peculiar variety, known as bluestones, used for curbing and flagging.

**Marble.**—New England is the principal home of the marble industry, Vermont producing more than half of the total output of the United States. The only other important producing states are New York, Georgia and Tennessee.

**Limestone** suitable for building purposes is found in nearly every state. The principal production is in a belt of states extending from New York and Pennsylvania on the east to Missouri on the west,

and includes, besides these states, Ohio, Indiana and Illinois. These six states contribute more than two-thirds of the total production.

**Cement.**—No one branch of the mining industry has shown such a notable growth in recent years as that of the production of cement materials and the manufacture of Portland cement. In 1888 the production of Portland cement in the United States was barely a quarter of a million barrels; in 1908 it was 51,072,612 barrels. Ten years ago the seat of the industry was in the Lehigh district of eastern Pennsylvania, that region turning out three-fourths of the total production. The Lehigh district is still the chief producer, contributing from 40 to 50 per cent of the total output, but the industry has become more generally distributed over the country, as the fireproof construction of large hotels, office buildings and apartment houses has been required to meet the demands of urban population, and railroad freights have acted as a protective tariff to local establishments.

**Gypsum.**—Gypsum, like cement, owes its rapid growth in recent years to the construction of large office, hotel, and apartment buildings. Its principal use is in the manufacture of wall plasters, and because of the hardness, durability and attractiveness of gypsum plasters, they have to a large extent superseded ordinary lime plasters. The utilization of gypsum for this purpose had its real beginning in the manufacture of "stiff" for exposition buildings.

Since the World's Columbian exposition at Chicago the increase in the use of gypsum plasters has been rapid. The higher grades of calcined gypsum, or plaster of paris, are used for making statuary and by dentists for making casts. Some crude gypsum of lower quality is ground and used for fertilizer.

**Chemical Minerals.**—Salt.—If we exclude water from consideration as a mineral product, salt is the one mineral substance whose chief use is as an article of food. Water, it is true, is a mineral, but with the exception of a comparatively small quantity taken from springs and sold as pure potable water or for medicinal purposes, water is not considered as a commercial mineral product.

**Distribution.**—Common salt is widely distributed. It is held in solution in sea water, and in the waters of land-locked lakes, as Great Salt Lake, the Dead Sea, etc. It occurs as brine springs and as rock salt and it is recovered from all of these sources. Probably the largest production at the present time is obtained from wells through which surface water is conducted to the salt beds, allowed to become saturated, pumped again to the surface and evaporated to dryness. Rock salt is mined in New York, Louisiana, Kansas and California.

**Production.**—Michigan is the largest producer of salt, all of the product being obtained by evaporation of brine from deep wells around Bay City and Saginaw. New York is second, most of its product also being brine salt from the western part of the state in Genesee, Livingston and Wyoming counties and from the old state reservation around Syracuse. Salt is also produced from brine wells in Pennsylvania, Ohio, West Virginia, Illinois, Kansas, Louisiana, Texas, Oklahoma, Utah and California. In Utah the source is the water of Great Salt Lake; in Cali-

fornia it is principally the sea water from Alameda bay.

**Phosphate Rock.**—The United States has to depend for its potash fertilizer upon the potash salt deposits of Stassfurt in Germany, and for its nitrates upon Chili. Other countries, however, send to the United States for their supplies of phosphate, and since the discovery of the land and river deposits of phosphate rock in South Carolina, just after the close of the Civil war, the mining and marketing of this valuable soil food has been a steadily growing industry.

During late years the industry in South Carolina has been declining, but this has been more than made up by greatly increased production in Florida, where it began something over twenty years ago, and in Tennessee, where it began fifteen years ago. Recently phosphate rock has been discovered in Arkansas and large areas have been located on government lands in Idaho, Utah and Wyoming.

**Sulphur and Pyrite.**—Sulphur is obtained from two classes of ore. In one the sulphur occurs native, intermixed with limestone, recovery being accomplished by the application of sufficient heat to melt the sulphur. The other source is metallic sulphide ores, principally iron pyrite, in which the ores are roasted and the sulphur fumes recovered as sulphuric acid. This is used chiefly in the manufacture of superphosphates.

Iron pyrite is mined for this purpose in Massachusetts, New York, Virginia, Alabama, Georgia, and California. In Illinois, Indiana and Ohio it is obtained as a by-product in the mining of coal. Only recently efforts have been made to recover the sulphur by the smelters of copper and lead sulphide ores. Sulphur is produced in only four states—Louisiana, Nevada, Utah and Wyoming. With the exception of Louisiana the production is small.

The method of recovery in Louisiana is of particular interest. The deposits lie at considerable depth and can be reached only by passing through an immense bed of quicksand. The sulphur is obtained by forcing superheated water through iron pipes, melting the sulphur and forcing it to the surface by compressed air.

**Borax.**—The entire production of borax is from three counties in California—San Bernardino, Inyo and Ventura. The desert marshes of Nevada were at one time important producers and the "twenty mule team" that hauled the product 200 miles across the desert was a spectacular advertisement. These deposits are of little productive value.

**Miscellaneous.**—**Asphalt and Related Bitumens.**—A variety of hydrocarbons is included under the general head of asphalt. They are used for the manufacture of street paving, road dressing, waterproofing metals, papers and fabrics, roofing, electrical insulation, varnishes, reservoir and foundation linings, coal briquetting, etc. Bituminous lime and sandstone are used chiefly for paving. The production is from five states—California, Utah, Texas, Oklahoma and Kentucky.

**Mineral Paints.**—These include metallic paints, mortar colors, ochers, umbers, siennas, ground slate and shale, though many other minerals or mineral products are also used in the paint trade for mixing with these basic pigments.

Among these substances are asbestos, amphot, clay, graphite, gypsum, magnesite, pyrite, talc and chalk. Zinc oxide and a mixture of zinc oxide and lead oxide

made direct from the ores are also basic pigments. The lead pigments, such as white lead, litharge, orange mineral, etc., are made by the chemical decomposition of pig lead, and Venetian red is made from the roasting of iron sulphate.

Of the natural mineral pigments (the ones first mentioned), metallic paint and mortar colors are produced principally in New York, Pennsylvania, Maryland, Ohio and Tennessee; small quantities in New Jersey, Virginia, Wisconsin and California.

The principal producers of ochers, umbers, and siennas are Pennsylvania and Georgia; with smaller amounts from Vermont, Virginia, Kentucky, Iowa and California. The slate and shale ground for pigments is for the purpose of producing a deep black color, and this material is usually retained as a by-product in coal-mining. These materials are ground for pigments in Pennsylvania, New Jersey, New York, Iowa and Tennessee.

**Asbestos.**—The United States leads all other countries in the manufacture of asbestos products, but obtains its chief supply of raw material from Canada.

The chief characteristics of asbestos are its incombuability by fire and its low heat conductivity which render it valuable for fireproofing and for insulation. It is of fibrous structure and one variety, known as chrysotile, possesses strength and toughness sufficient to weave into fabrics, and is used for making fireproof theater curtains, etc.

Canada is the principal producer of this variety. Asbestos is used for boiler and safe packing, in the manufacture of paint, and as an electric insulator. Asbestos boards, shingles and other forms for fireproof construction are now quite common. Vermont and Georgia are the only two states in which it is produced in this country, and the output compared with the imports from Canada is small.

**Other Minerals.**—There are some forty other minerals among those mined for economic use. There are, for instance, corundum and emery grains and feldspar granite, grindstones, infusorial earth, tripoli, millstones, oilstones and pumice, which are included among the products used for abrasive purposes.

**Bromine,** a by-product of salt evaporation, is useful in the chemical industry.

**Fluor spar,** mined principally in Illinois and Kentucky, is used as a blast furnace flux, for the manufacture of hydrochloric acid and for the manufacture of opalescent glass.

**Feldspar and quartz** are used in pottery works. **Talc** is used as a lubricant for making pencils and in the manufacture of complexion powder, and a fibrous variety is used as a make-weight in paper manufacture.

**Mica** is used for windows in fireplaces and "base-burner" stoves, for the manufacture of insulators, and lamp chimneys for decorative purposes, and as a lubricant. It is mined principally in North Carolina.

**Graphite,** which is mined principally at Ticonderoga, N. Y., is used in the manufacture of lead pencils, crucibles, and as a lubricant.

**Monazite,** mined in North Carolina, is used for the manufacture of the mantles used in the Welsbach lights.

**Tungsten and cerium** are used in the manufacture of special steels.

**Sand** is used for the manufacture of mortar, for molding and other purposes.

**Manganese and mangiferous iron ores** are used in the manufacture of steel.

**PRODUCTION OF THE PRINCIPAL MINERALS AND METALS, AND THE TOTAL VALUE OF ALL MINERAL PRODUCTS IN THE UNITED STATES, BY STATES**

Figures in bold-face indicate the ranking states.

STATES	RANK	COAL Short Tons	RANK	IRON ORES Short Tons	RANK	GOLD Value	RANK	SILVER Value	RANK	COPPER Pounds	RANK	LEAD Short Tons	RANK	ZINC Short Tons
Alabama	5	11,601,563	3	3,734,438	10	41,200	21	200	11	20	1	1,464	16	122
Alaska		See Note a.			2	19,855	8	100,800	6	299,438,367	20			2,002
Arizona	19	2,078,357	13	56,906	18	19,379,100	2	1,551,200	1	39,643,375	12	815	18	34,883
Arkansas	27	21,862	10	10,176	1	22,871,900	2	5,429,400	7	13,943,675	4	28,758	2	
California	8	6,634,973	16	28,112	1									
Colorado	25	264,822	11	321,060	14	56,200	22	100	10	7,255,086	2	98,464	10	381
Connecticut	28	2,429	9	1,443,560	9	1,443,560	19	4,042,900	3	1,160	14	363	14	309
Delaware	2	47,659,690												
Florida	6	12,314,590												
Georgia	9	7,161,210												
Idaho	10	6,245,508												
Illinois	7	10,246,553	14	53,235										
Indiana	13	4,377,093	See Note d							See Note g				
Iowa	23	1,835,019	2	8,839,169						222,289,584				
Kansas	15	3,317,315	12	98,414	7	3,100,000	1	5,539,500	13	1,280,831	1	125,451	1	123,653
Kentucky	20	1,920,190	8	516,449	7					252,565,651	7	2,330	9	900
Louisiana	18	2,467,937	10	396,767	18	2,700	17	3,400	16	13,139				
Maine	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Maryland	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Massachusetts	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Michigan	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Minnesota	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Mississippi	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Missouri	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Montana	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Nebraska	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Nevada	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
New Hampshire	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
New Jersey	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
New Mexico	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
New York	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
North Carolina	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
North Dakota	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Ohio	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Oklahoma	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Oregon	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Pennsylvania	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Rhode Island	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
South Carolina	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
South Dakota	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Tennessee	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Texas	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Utah	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Vermont	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Virginia	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Washington	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
West Virginia	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Wisconsin	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134
Wyoming	13	2,467,937	See Note e	11	306,300	9	214,500	10	4,991,351	11	886	5	6,826	134

**PRODUCTION OF THE PRINCIPAL MINERALS AND METALS, AND THE TOTAL VALUE OF ALL MINERAL PRODUCTS IN THE UNITED STATES, BY STATES—Continued**

- a. Includes Alaska.  
b. Includes Texas.  
c. Includes Massachusetts.  
d. Includes Maryland and West Virginia.  
e. Includes Nevada, New Mexico, Utah and Wyoming.  
f. Includes unexported copper.

- g. Includes Alabama, Maryland, South Carolina and South Dakota.  
h. Includes Missouri.  
i. Includes Wyoming.  
k. Includes Georgia.  
l. Includes Washington.  
m. Includes South Dakota.

- n. Includes Kentucky and Tennessee.  
o. Includes Oklahoma.  
p. Includes Arizona.  
q. Includes Maryland and Massachusetts.  
r. Includes Illinois, Pennsylvania and Virginia.  
s. Includes Alabama and Texas.

**THE FISHERIES OF THE WORLD.**

The fisheries of the world constitute one of its most important industries, and at the same time furnish a very important part of the material used for human food. The aggregate value of the catch for a single year cannot be closely estimated, but it must exceed the sum of \$100,000,000, a sum, let us say, equal to the cost of half a dozen battleships.

**Capture of Fishes.**—Fishes are taken on every shore of every country, some species in nets in sandy bays, some with hook and line or other devices from among rocks, some in great schools in the open sea while migrating to and from their spawning grounds, some as they enter rivers for the purpose of spawning in fresh waters.

To the first class, those taken in sandy bays, the great majority of the different species belong, notably the tribes of the croakers and drums, the sea bass, the sardines, the barracudas, the mullets, the flounders and soles and the great array of scaly fish of the sea.

About rocks are found the hosts of rock cod, of wrasse fishes, of groupers, and, in tropical regions, of parrot fish and a multitude of forms which swarm about the coral reefs.

The codfish and halibut, with their relatives, are mostly taken with hand lines in water relatively deep.

In schools in the open sea are the mackerel and nearly all of its many relatives, from the mighty swordfish and the giant tuna, to the little chub mackerels that swarm on the coasts of all northern regions.

**The Salmon Fisheries.**—As important as any of these groups is that composed of anadromous fishes—that is, of fishes which ascend the rivers to spawn.

**Red Salmon.**—Easily first among these is the red salmon of the northwestern waters, which runs in the rivers at the age of four years, every individual of either sex dying after spawning. This species runs only in streams having lakes in their course. It spawns in gravelly streams at the head of the lake. The young spends the first year in the lake, then passes down to the sea, where it feeds on young crabs, small herring and the like, returning when four years old to cast its spawn, for the most part, in the same river in which it was hatched. This species reaches a weight of about six pounds. It is chiefly used for canning. Its flesh is very red, but inferior in flavor to that of the king salmon.

**The King Salmon,** or quinnat, of the Pacific ranks next in value among anadromous fishes. It is much larger than the red salmon, averaging twenty-two pounds and sometimes reaching 100. Its flesh is more delicate, but the aggregate value of the species is less, as it is far less abundant in Alaska, although it is the dominant species in the Columbia, the Sacramento and the Amur. It, too, ascends streams to their fountain heads, but it is not restricted to those with lakes. Both

species ascend the Yukon river as far as Lake Labarge, upward of 2,000 miles, and both follow the Fraser and the Columbia to the uttermost waters.

**Other Species.**—Four other salmon of the Pacific are of value—the Atlantic salmon, the steel-head of the Pacific, the sturgeon of many species, fishes of great value for their steak-like flesh and for their eggs used as caviare; the shad, the alewife, the striped bass, the smelt, the caluchon and numerous less known fishes of the tropical and south temperate zones.

**The Lake Fishes.**—There are also fishes in enormous variety in the rivers of the world, and especially in the lakes. First among bodies of fresh water come the Great Lakes of North America, and among these Lake Erie ranks highest as having for its size the most valuable fresh water fisheries of the world. Of the fresh water fishes the whitefish of the lakes ranks first in value, though some other species less esteemed, as the lake herring and the pike perch, sometimes yield a larger output.

**Cod Fisheries.**—The cod and halibut, with the haddock, pollack and other lesser fish, swarm off the rocky coast of Iceland, British Columbia, Newfoundland, Alaska and eastern Siberia. The cod especially furnishes a fishery of the greatest importance.

**Tropical Fisheries.**—In the tropical seas the number of species is vastly greater, but none of them is so abundant in individuals. A single haul of a small net at Key West, Fla., yielded seventy-five species of fishes, almost as many as all that frequent the shallow of the British Isles. There are 500 species of fishes found at Samoa, the majority edible. This is as many as are found in the whole of Europe. North America has upward of 2,500 species, in fresh and salt waters, and about 12,000 are known over the whole world. There are many species in deep waters. Some of these are valuable for food when the proper gear for taking them can be used.

**Deep Sea Fishes.**—Fishes are found to the depth of nearly five miles. Those in great depths are black in color, flabby in substance, and either blind or else provided with very large eyes and luminous spots, like lanterns. In some cases these luminous spots are on the end of the nose, like the headlight of an engine. In moderate depths, as one-eighth of a mile, most species are bright red. These red fishes are often of great value as food. They are now sought for in many regions by means of long hand lines or the beam trawl.

In temperate regions, as in the United States, in England and in Australia, only a few of the many sorts of fishes are utilized as food. The others meet no sale, even though in many cases they may furnish good food. But in tropical markets, as in Italy, Cuba, Hawaii and Japan, nothing is thrown away. All kinds of sea-fish not actually harmful is preserved, and in these markets a most interesting variety of sea animals may be seen.

**Artificial Hatching.**—The process of the artificial hatching of fishes has now risen to great prominence. In nature the eggs of fishes are usually scattered about in the water to be fertilized by the similarly scattered milt, or germ cells of the male. In some cases, as the black bass, the male builds a rough nest and guards the eggs and the young. But this is not the usual rule. In general, the eggs are at the mercy of other fishes, crabs, and even of multitudes of bacteria. Not one in a thousand usually matures, often not one in a hundred thousand. By taking the eggs, and washing them with the milt artificially, a vastly larger number can be made to hatch. By caring for the young and by depositing them in suitable places, as many as one in a hundred or even one in twenty can be brought to maturity. This work has been especially successful with whitefish, lake herring, the various kinds of trout and salmon, and the pike perch.

In case of a few species, as the black bass and sturgeon, artificial fertilization of the eggs has been found impossible. In the great majority of cases, however, the process is very successful.

**Output of Artificial Fish Hatcheries.**—Numbers of young fish planted by the United States fish hatcheries and private hatcheries:

Salmon.....	164,648,179
Trout.....	75,829,439
Whitefish.....	419,884,000
Shad.....	6,374,000
Striped bass.....	1,599,195
Pike perch.....	644,900,000
Yellow perch.....	225,000,000
White perch.....	343,263,850
Cod.....	184,428,000
Flounders.....	786,628,000
Other fish.....	40,617,180
Lobsters.....	104,509,000

Total.....3,107,131,910

**Fishing Nations.**—Among the fishing nations, the United States, Great Britain, Norway, France, Canada, Italy and Japan rank first. In northern regions there are relatively few species, but these few run in enormous numbers. The herring schools on every northern shore, above the latitude of Boston and as far as the Arctic circle. Björnson says that wherever the herring schools took the shores of Norway a town springs up, like driftwood cast up by the sea; so it is in Ireland, Scotland, Canada and Japan, and so it will be some time in Alaska. Huxley estimates that there are more herring in existence than individuals of any other kind of fish.

In the Atlantic the mackerel has also its vast predatory schools, but the true mackerel is not in the Pacific.

**FORESTS.**—Reliable data regarding the forested area of many countries are difficult to obtain, owing to imperfect surveys, lack of statistical facilities, etc. For Europe and the United States the reports are more complete.

The percentage of land under forest in Bessonia and Herzegovina is reported as being about 53 per cent, 45 per cent in Bulgaria, 44 per cent in Sweden, 40 per cent in Russia, 30 per cent in Austria-Hungary and Luxemburg, 26 per cent in

in Germany, and 21 per cent in Norway; the remaining countries of Europe have less than 20 per cent forest land.

The forests of India embrace about 13 per cent of the area of that country, of Japan 59 per cent, of Canada 40 per cent, and of the United States about 36 per cent.

In Europe a large portion of the forests belong to the state, and from them important revenues are obtained. The percentage of domain forests amounts to 84 per cent in Spain, 80 per cent in Greece, 70 per cent in Bosnia and Herzegovina, 61 per cent in Russia, 47 per cent in Roumania, 33 per cent in Germany, and 27 per cent in Sweden.

**Lumbering.**—Comprises the felling, and preparing of wood for building purposes, shipbuilding, furniture manufacture, paper making, and a variety of other uses. It forms one of the most important industries

of the United States, Canada, and of some European countries. The industry, especially in America, is well organized, and is subdivided into:

1. Logging, which includes the felling, cutting in lengths, and transporting to the mill.

2. Sawmilling of the logs into rough timber, beams, joists, boards, and laths.

3. The planing of these.

In the Northern states and in Canada lumbering is chiefly carried on in winter, and the logs are transported on sleds over the icy roads to rivers and lakes, where they are floated either singly or in rafts to the mills.

The chief wood-exporting countries are the United States, Canada, Austria, Norway, Sweden, and Russia; Great Britain and Germany being the largest importers.

**Extractive**, under which heading are considered mining, agriculture, forestry, fishing, and hunting;

**Manufacturing**, whether by the handicraft or the factory system;

**Distributive**, or those concerned solely with the marketing of products.

Auxiliary to these are the pursuits of transportation, lending, insurance, and warehousing, which because of the division and the specialization of occupations have become distinct enterprises.

**The Business Unit.**—The extractive industries is comparatively small, seldom reaching the size of modern manufacturing, merchandising, or transportation concerns; having smaller capitalization per unit and employing fewer laborers, it is simpler in structure.

With the breaking up of plantations and large estates, with the ever-increasing demand for intensive cultivation of small areas, farming particularly is lacking in the complex and extensive organizations so characteristic of the factory system.

**Natural Conditions.**—One of the essentials of the extractive industries is their great dependence upon natural conditions for their success or failure. Unless natural supplies are present and accessible, no amount of capital, administrative skill, or labor, and no combination of these factors will produce a profitable mine, quarry, or lumbering camp, and no farm will pay unless climatic conditions are favorable and the soil is good or can be made so. Efficiency of labor and of equipment, proximity to the market and good transportation facilities are important, but it is nature, with its deposits of mineral wealth, its sunshine and rainfall, its fertile soil, its rivers filled with fish, its world of animal and vegetable life—it is nature which gives the chief value to each extractive industry.

Correct judgment as to the extent to which each extractive enterprise may be capitalized is therefore necessarily based upon exact knowledge of natural conditions. The public so eager to join "get-rich-quick schemes" must in most instances blame no one but itself for its losses.

All the assertions of a fraudulent or of an overenthusiastic promoter cannot create a rich gold mine or a petroleum gusher. If these exist, their presence as well as their commercial worth can be ascertained beyond reasonable doubt by modern methods of careful scientific investigation.

**Organization.**—It was in the manufacturing industry that the new type of business organization arose. The highest expression of this industry—the factory system, with its modern steam and electrically driven machinery—has increased a thousand fold the efficiency of men; it has given an opportunity to exercise the highest strategic ability in the massing and grouping of laboring forces, and in the direction of these forces toward the common goal—the production of finished commodities. Out of materials most of which in their raw state are useless the mill and the factory produce a bewildering variety of goods, capable of sustaining us, of supplying our needs and wants, of giving us joy and comfort.

**Factory System.**—The work in the factory necessitated the cooperation of individuals on a scale unknown in any other type of industrial activity. The process of production was divided into many component parts, each part dependent upon the other and the whole calling for a systematic



## BUSINESS AND COMMERCE

### BUSINESS ORGANIZATION, ADMINISTRATION AND ECONOMICS

**BUSINESS ECONOMICS.**—All industries are conducted for purposes of profit. Their size, their organization and management are subordinate to this main consideration of yielding returns on the investment.

The investor in a modern enterprise, unless he has the majority of stock and thus the controlling interest, does not shape the business policy of the undertaking.

**Classes of Industrial Enterprises.**—All enterprises may be divided into two categories:

**Non-Speculative Industries**, or those attended with ordinary business risks; and

**Speculative**, or those in which the risks are unusually large.

In order to induce investments in the latter class of industries the allurements of exceptionally high profits is necessary. It may be noted here that some profits of this kind are at their best doubtful, and that many illegitimate schemes have been launched by unscrupulous promoters under the guise of an industry.

**Methods of Financing.**—The owner may have sufficient means to carry on and develop his business, but this is not the usual method of financing. When more or less large amounts of capital are required, three alternatives are open to the owner: (1) Borrowing money; (2) taking in moneyed partners; (3) incorporating and offering stock for sale.

The first two methods are not always feasible and have many disadvantages, such as the necessity to meet loan and interest obligations frequently at most inconvenient times, the partner's interference with the management, etc. The third plan may be considered the best, and it is the one most often used.

**Selling "Stock."**—There are two ways of offering shares to capitalists: one, by personally presenting the case to friends or strangers by means of interviews or correspondence; the other, by appealing to the public through circular letters, newspaper and magazine advertisements, etc. In either case, a prospectus, describ-

ing the nature of the enterprise, its scope and its special advantages, is usually prepared.

**The Prospectus** should be a document containing neither exaggerations nor misrepresentations, but at the same time putting the proposition in a most favorable light. It should be carefully arranged, and while giving details (would-be investors are naturally inquisitive), it should not be overloaded with immaterial facts which might obscure the main issue. The writer of a prospectus must know what to omit as well as what to include in his paper.

**Essential Facts.**—To substantiate facts contained in the prospectus, reports, certificates, analyses, abstracts of title, etc., must be on hand, so that any one desiring to investigate the proposition may be immediately shown all the data proving the accuracy of the promoter's assertions. An investigation before investment, unless the offer is of gilt-edged stock or bonds of national reputation, is imperative. When the prospectus is distributed, a personal or a facsimile letter generally accompanies it. In this letter are set forth the strongest features of the project.

**A Financial Statement**, indicating definitely how much money is needed, for what purposes, and how much stock is offered to secure the amount, is sent only to those parties who are sufficiently interested to justify the beginning of negotiations.

**Importance of Efficient Management.**—The nature of the enterprise is of comparatively little importance to the average investor as long as his capital is protected and his income assured; but he cannot be sure of either unless the undertaking is sound, well organized and efficiently managed. Some enterprises have failed because of lack of adequate capital, but immeasurably larger is the number of those which have come to grief either because of poor foundation or because of mismanagement.

**Classification of Industries.**—Legitimate industries may be divided into the following classes:

coordination of effort. Unless there was one ruling spirit dominating the part-activities of the mammoth factory, all its capable workmen, all its powerful engines, all its delicate and intricate mechanism, all its rapidity of motion would have been of comparatively little value.

**Specialization.**—From the operating rooms of the factory, the principles of specialization were transferred to the offices and to the counting-houses, to the banks and to the department stores. Every branch of human endeavor where the scope and the importance of the difference of a differentiation of functions, a strict fixing and enforcing of responsibilities, and an assumption of central supervision and control learned the value of subdividing into departments and of combining the related parts into a harmonious working unit.

**The Essentials** in the organization of each business are more or less alike. The departments must correspond to those natural divisions into which a concern resolves itself and thus fit the peculiar conditions of a specific enterprise, but the guiding principles of organization are the same, whether we deal with a factory, a transportation company, or a jobbing house.

**The Problems** which business organization must solve are problems of uniting a body of individuals in such a way that, grouped for the performance of certain transactions, they may work without waste and friction, adding to the precision of a machine the intellectuality of men.

**Departments.**—A large business concern is divided into departments because of the fact that the different kinds of work which must be performed in such a concern demand special training, both on the part of the authorities who govern the work and on the part of the subordinates.

Different methods of procedure characterize the purchasing, the advertising, the manufacturing, the accounting and other activities of a business unit. In order to secure successful results, each activity is placed under the immediate supervision of specialists, who act as heads of departments and direct the labor placed under their control. The sphere of action and the responsibility of departmental heads is clearly defined. This insures the greatest accuracy, economy, and dispatch.

The primary divisions of a business enterprise, regardless of its size or nature, are as follows:

1. *The Executive (managerial) division.*
2. *The Commercial (and office) division.*
3. *The Productive (factory, mine) or the Handling (transportation service, store) division.*

The subdivisions and the departments vary, groupings being effected and systems evolved which lead to the most effective operation of business.

In a factory the number and the character of the departments is determined by the demands of a standardized machine production which moves materials with an automatic regularity from one stage of manufacture to another until they reach as finished commodities the selling end of the organization.

The more general departments of a factory are the receiving room, the storing room, designing, drawing and experimenting rooms, tool-rooms, power, fuel and lighting plants and the shipping room; to these are added different workshops, such as foundry, assembling and erecting rooms, etc.

The commercial division consists of accounting, correspondence, advertising, selling, and credit and collections departments. A legal department is usually connected with credit and collections.

**Management.**—Most of our modern large undertakings are organized as corporations and the same initial executive authorities may be found in each concern.

**Directors.**—The proprietors or stockholders elect a board of directors, the latter selecting the executive officers—president, vice president, secretary and treasurer. If the board of directors is too numerous for an expeditious handling of affairs it either elects or appoints an executive committee. Some of the very large firms have also an advisory committee and a number of subcommittees to supervise special branches of their activity, such as finance, improvements, sales, etc.

**General Manager.**—Under the board of directors and responsible to it is the general manager, who has direct control over all the departments. He must possess constructive ability, his qualifications including wisdom and skill in selecting the right kind of men for various positions and of cultivating a spirit of fellowship and good-will in the staff.

The general manager formulates (in conjunction with the president and the board of directors or the executive committee) the business policy of the enterprise; he must therefore be familiar both with the technical and the commercial side of the business; he must understand the workings of every department, not only the details which should be left to the chief force, the factory workmen, the foreman, the salespeople, but the main principles governing the relation between the man and the tool, the effort and the result.

A successful manager combines with a determination to carry out plans once formulated an adaptability to changing conditions and a willingness to accept suggestions. Such a manager inspires confidence in his superiors and commands the obedience and respect of his subordinates.

In a manufacturing concern his immediate assistants are a superintendent, at the head of the manufacturing division, and a comptroller or auditor, under whose direction is the commercial branch.

Under the superintendent are the chief engineer, the chief draftsman and foremen who supervise the work in the shops; under the comptroller are the chief accountant, the head of the correspondence division, the sales manager, the advertising manager and the credit man.

**Accounting.**—The accounting department, although not engaged in the active forwarding of business, is of supreme importance. In this department the bookkeeper and his assistants keep records of every transaction, from the largest, to the smallest, thus furnishing data for an insight into the workings of every branch of the business. There are two main systems of bookkeeping—the single entry and the double entry. The difference in the methods is indicated in their names; the first method consists in a single, the second in a double recording of commercial facts in the account books of the concern (the journal, the ledger, the cash book, the stock book, etc.).

A single entry only registers the personal relations of the firm with its creditors and debtors and the variations in stock and cash on hand; the double entry, by having for each credit a countervailing debit and vice versa, indicates also the

gains and losses; it shows the interdependence existing between the various factors which make up a business enterprise and it permits a rapid detection of mistakes in posting. The double entry system is the one most generally adopted, single entry being confined to small enterprises or to those very few of the somewhat larger concerns which are blind to the evident superiority of the double entry.

**The Auditor** is the officer of the accounting department who evolves systems of accounting, passes on the correct posting of data and sees to it that every item is charged to its proper entry. The auditor also prepares comparative statements and other reports, such as inventories, pay rolls, etc.; these are submitted to the general manager, thus enabling the latter to know always the firm's standing.

The highest officer in the department is the chief accountant. He dissects and analyzes the facts of the business as they are revealed by the accounts; he estimates the cost of production and traces to their sources all profits and losses. He must be able to look far beyond the books of the company; the general principles of similar businesses and their relation to the commercial and financial world at large must be known to him. Without this he cannot have an intelligent appreciation of the statistical business facts in a particular enterprise and cannot make suggestions as to improvements.

The keenness of present day competition does not allow haphazard methods; the whole drift of modern industry is toward a systematic decrease of production-costs and an increase of business efficiency. This explains the great value of the chief accountant's work.

**Distributive Industries.**—Raw materials, particularly agricultural products, are marketed through the medium of boards of trade or exchanges. Such goods are bought by either domestic manufacturers or exporters; in both cases the transaction involves a comparatively large quantity of a commodity and the buyers demand a certain definite grade or quality. The supply comes from widely separated sources, from small farms and large estates, from every rural community which produces in excess of its home consumption. The problem of concentrating the supply is solved by the existence of a special class of traders who have established themselves at those strategic points which, because of their geographic position, have become primary markets for the sale of such goods as wheat, raw cotton, provisions, tobacco, live stock, etc.

**Exchange.**—To facilitate the handling of business, the traders have formed associations known as produce exchanges or boards of trade. An exchange is a corporation controlled by the law of the state in which it is located. Its charter sets forth the object of the association, which usually is to provide rooms where the members may meet, to establish and maintain uniformity in commercial usage of the place, to acquire and disseminate business information, and to adjust controversies between the members.

**How Constituted.**—Each exchange frames its own constitution and by-laws. The latter indicate who may be admitted to membership as well as the conditions on which the members are allowed to transact business. Violations of the rules meet with prompt punishment ranging from a few dollars'

fine to expulsion from the exchange. The number of members is invariably limited. Like all other corporations, exchanges are governed by a board of directors or managers elected by and from the members of the exchange. The board appoints various standing committees (a law committee, a floor committee, a finance committee, a trade committee, etc.), as well as all the employees and agents, such as secretary, attorneys, inspectors, weighers, gaugers, etc.; it enforces the rules of the exchange and it supervises the financial and other affairs, as well as the property of the organization. In order to defray the expenses of the exchange an annual assessment is made upon each certificate of membership.

The contracts concluded on the exchanges may be divided into *spot*, or *cash*, *dealings* and *futures*.

**Spot, or Cash.** Transactions represent the purchase and sale of goods available for immediate delivery. These goods are either in cars on railroad tracks or in warehouses, and they are offered for sale by means of samples. Each sample is provided with a certificate of grade. In most states the inspection of great staples and their grading as to freedom from impurities, soundness, color, etc., is conducted by public officials, the state thus guaranteeing the grade; this is particularly true of grain.

**Warehousing.**—Exchanges have evolved a carefully devised system for regulating the trade in each commodity. If the goods are not unloaded, the samples are accompanied by a ticket indicating the name of the railway company over which line the products have come and the number of the car which holds them; if they are unloaded and stored in a *regular warehouse* (by "regular" is meant a warehouse recognized and supervised by the exchange), then a *warehouse receipt* is issued to the prospective buyer. The receipt shows that a certain quantity of goods of a certain quality has been accepted by the warehouseman and is ready for delivery. When a sale takes place the receipt is indorsed by the seller and given to the buyer.

Warehouse receipts are unquestioningly accepted by dealers because they are confident that each receipt represents goods actually in the possession of the warehouseman, and that these goods will be delivered to them on the presentation of the document.

**Futures.**—The concentration of distribution in a few central markets, the character of the commodities dealt in (staples), the readiness with which the price of these commodities responds to world-wide influences of supply and demand, have created a tendency for speculation on the floors of the exchanges. Speculative transactions are generally known as *futures*.

Futures have developed from ordinary time dealings and they are not necessarily speculative in their character; among buyers of futures may be found millers, spinners, distillers, and other manufacturers who buy in order to cover their future needs for raw materials; among sellers are many farmers who dispose of their products before harvesting at a current price which they consider advantageous.

**Nature of Contract.**—A necessary condition for the existence of futures is a well-regulated market for classified standard commodities. The contractual stipulations of futures conform to the requirements of the exchanges as to grades, units of amount and terms of delivery. Each

exchange has an accepted form of contract which leaves open to the contracting parties the determination of the price, the month of delivery, and the total of the amount (always in the accepted unit or its multiples).

In the majority of instances both buyers and sellers of futures are speculators. The buyers purchase because they anticipate a rise in price, and the sellers assume obligations because they believe the price will drop.

**Bulls and Bears.**—Those speculators who have bought with the intention of reselling before the date of delivery are known as *bulls*. They naturally take advantage of every opportunity to influence the market in the direction of higher prices.

Those who have made sales without possessing the goods are known as *bears*. Their efforts are directed toward depressing the market, as they must buy before they are called upon to meet their obligations.

**Margins.**—Many outsiders speculate on the exchanges; to do so they resort to the services of *exchange brokers*; the trading is usually done on *margins*, the margin being a deposit of so many cents per bushel, bale, or other unit of product. The amount is given the broker to protect him in case the market goes against his customer. It must be understood that the broker, as a member of the exchange, is held responsible for the fulfillment of all the contracts concluded by him. Should unfavorable price fluctuations exceed the deposited amount, an additional margin is demanded by the broker, and if the demand is not met, then the transaction is wound up and the sum originally deposited is forfeited. For his services the broker is entitled to a commission, the rate of which is established by the exchange.

**Delivery.**—The majority of futures do not involve an actual delivery of goods; the purchase and sale contracts are compared, and a payment of the difference between the two prices liquidates the transaction.

**Privileges** are a form of speculative contracts officially recognized by the exchanges; they are concluded either before or after the regular trading hours. Privileges are *puts*, *calls*, and *straddles*.

The *put* is a contract by which a person acquires the right either to deliver or not to deliver a certain amount of goods at a stipulated price; the taker of a *put* receives a fixed consideration for which he agrees to accept the goods if they are offered for delivery.

A *call* contract the right is acquired to request or not to request the delivery of goods at a specific price.

A *straddle* is a combination of a *put* and a *call*. It permits the purchaser of such a contract either to call for goods or to deliver them.

The takers of privileges accept the risks because they expect the market conditions to be such as not to warrant their being asked to fulfill their part of the contract. Privileges are often used by bears and by bulls as means for speculative insurance. A bear, for instance, buys calls; this enables him, if the price rises, to meet his obligations by requesting the taker of the call to deliver the goods in his stead.

**The Sale of Manufactured Goods.**—In the marketing of agricultural products the problem confronting distributors is that of concentrating the supply; in the sale of manufactured goods their task is that of dividing the supply into small units

in order to reach the numerous final consumers. The methods used are necessarily different from those employed in the first case. Dealers in finished commodities do not belong to closed market organizations demanding certificates of membership and regulating the trade.

**Direct Selling.**—Any one may at any time operate in any market as a wholesaler or a retailer, and the selling organization of any factory may eliminate both, and enter into direct relations with the consumer. The latter system, that of *direct selling*, has been gaining ground recently, factories establishing their own retail stores, sending out canvassers, or conducting a mail-order business. In each case the producer seeks to gain control over the market, to create and to maintain a demand for his particular goods.

Illustrations of the *factory retail store method* may be seen in the Regal, Douglas and Walk-Over shoe stores, in the Huyler's or Gunther's candy stores, in the United Cigar stores, and in a number of stores established by typewriter and camera manufacturers. Each store is responsible to the main office, with which it must keep in close touch.

The *canvassing method* is used especially by the publishers of books and magazines. The *mail-order system* is used by the makers of furniture, of ready-made clothing, of novelties, etc.

Many manufacturers, for the purpose of regulating the sale of their output, have established *exclusive agencies*, which are modifications of the retail store plan; this method relieves the manufacturers of the necessity for entering into the retail sales business, at the same time permitting them to assign territories, determine prices, observe the market conditions, and push sales. The agent is usually selected from among reputable retail dealers best fitted to handle the goods.

The *Mail-Order Business* has grown to large proportions within the past two decades. It has been adopted not only by manufacturers but also by a number of retail firms, which from some central distributing point reach every town, every village, and every farm in the United States. They send out elaborate catalogues and other advertising literature, describing their goods and offering them at prices which usually cannot be met by the local general store.

Montgomery Ward & Company, and Sears, Roebuck & Company, both of Chicago, are the two most important concerns of this class; their yearly sales amount into many millions of dollars. Most department stores maintain mail-order branches.

**Wholesalers and Jobbers** are intermediaries between producers and retailers; in some instances their activity has been superseded by direct dealings between the factory and the consumer, or the factory and the large retailer, but as yet they are a very important factor in the campaign of distribution. They control the trade of such storekeepers as do not buy in sufficiently large quantities to enable them to deal directly with manufacturers, thereby securing wholesalers' discounts.

Many retailers prefer the services of the *jobber*, because buying from the factories necessitates the placing of orders many months in advance, and because dealing with the jobbers permits them to carry a more diversified stock; the jobbers gather the outputs of many mills, from which their customers may make selections and take the desired quantity.

Most wholesale houses specialize in one line of goods, such as clothing, groceries, drugs, dry goods, hardware, etc.; however, there are a number of general jobbing houses. The retailers are reached by means of traveling salesmen or catalogues; frequently a combination of the two methods is adopted.

**Department Stores.**—A most interesting phenomenon in the retail business has been the rise of the *department stores*. These stores have acquired a large share of city trade. Their business policy may be summed up as follows: Small profits on each sale, provided this leads to a quick turnover of capital; one price plainly marked; exchange of goods or refunding of money in case of dissatisfaction; cash payments, the granting of credit being an exception.

**Organization and Advantages.**—The buying division of a department store, alert as to where, when, and how to buy most advantageously, is connected with many sources of supply; department stores can secure better purchasing terms than small dealers because they buy in large quantities; their expense of handling goods is also proportionately smaller than the expense of those stores where there are only a few articles of each kind. This enables such stores to ask lower prices. Department stores offer to patrons many shopping comforts not to be found elsewhere; the stores are characterized by spaciousness; they are well lighted and ventilated, have reading and retiring rooms, etc. The possibility of doing practically all the shopping under one roof is another great advantage.

The main strength of *special single line stores* (they hold their own in cities) is in their higher grade of articles they carry and in the placing of personal service above all other considerations. Their patronage comes largely from the well-to-do who seek quality and style, for which they are willing to pay. In certain lines of retail business special stores predominate; this is true of drugs, groceries, musical instruments, etc.

**The Foreign Market.**—The foreign markets of the United States are usually considered from the point of view of export business, the fact being overlooked that in these markets our country is buying annually over a billion and a quarter dollars' worth of goods, and that there are many problems to solve in connection with importations from abroad.

**Importing.**—Goods coming from foreign countries are admitted into the United States only at some *port of entry*, which is usually also a *port of delivery*, or a place where the importer may, upon the payment of customs duties and other charges, receive the merchandise. For the convenience of importers a number of inland points have been designated by the government as ports of delivery.

**Bonded Warehouses.**—All imported merchandise may be entered either for *consumption* or *in bond*. In the first case, the duty must be paid immediately and the goods may be withdrawn to any place to suit the convenience of the consignee; in the second instance, the *collector of the port*, who is the chief executive officer of the customs district, requires a bond double the amount of the estimated duties; the goods must be either placed in a *bonded warehouse* at the port of arrival or entered for transshipment via a *bonded route* to some interior port of delivery. The importer is thus relieved of the necessity

of paying more or less large sums of money to the government before he actually needs the goods.

All *bonded warehouses* are placed under the control of specially designated customs-house officials, and they must comply with certain regulations regarding the receipt and the custody of goods; the storage charges are usually somewhat higher than in ordinary warehouses.

**Customs Regulations.**—Goods are admitted into the United States by filing a *declaration*, the form of which is prescribed by law. When the value of imports exceeds \$100 a *certified consular invoice* must be presented by the consignee to the customs-house through which the articles are to pass. This invoice contains a detailed statement of the consignment, indicating the quantity, the nature and the price of the things imported, as well as all the costs incidental to their shipment to the United States.

The name consular is given to the invoice because its accuracy is guaranteed under oath before an American consul in the district in which the merchandise is exported; the consul certifies to this fact by affixing his seal and signature to the document. In case a certified invoice cannot be produced at the time of making the entry, a *pro-forma invoice* must be presented and a bond be given to the government for the subsequent production of a certified invoice.

It is of great importance that the goods when entered should be designated according to their classification in the tariff, and that they should be assigned to their proper class, as the class regulates the rate of duty. For the purpose of avoiding sometimes costly mistakes importers resort to the services of *customhouse brokers*, who make entries for them and see to it that all the customs administrative formalities are complied with.

**The Appraiser.**—When goods arrive, one package out of each ten is sent to the appraiser's store; the appraiser examines it, and decides whether its contents correspond to the invoice and whether the declared price is correct. Should the appraiser's findings warrant an advance in the price of over 10 per cent, a penalty fine is levied, and in case the advance is over 40 per cent, the goods may be confiscated. A *protest* against the decisions of a local appraiser may be submitted by the importer to the board of general appraisers.

**Exporting.**—Large manufacturing concerns doing export business have their *agents abroad*, who work in territories assigned to them. This is the most satisfactory way of meeting foreign competition, of gaining new and keeping old customers. However, this method is too expensive for smaller firms. These latter deal with possible purchasers either directly by means of *correspondence*, or indirectly by intrusting their interests to the care of *export commission houses*.

Export commission houses may be regarded as resident buyers for foreign merchants; they receive orders from abroad, finance the payment of bills, and direct the shipment of goods; they are paid for their services a commission of about 2½ per cent.

**Methods.**—The sending out of *traveling salesmen* and *advertising* in foreign countries are both increasing in importance as methods of developing export business.

**Export Syndicates.**—In some countries merchants carrying on an export and import

business form *export syndicates* whose objects are to keep its members posted concerning the conditions in foreign markets, the financial standing of buyers, trade opportunities, tariff changes, etc.

**Commercial Museums.**—A very important institution for the promotion of foreign trade is a commercial museum. It is usually of a quasi-public character and is established and maintained either entirely by state and municipal authorities or with their assistance.

Commercial museums exhibit *sample products* from various parts of the world thus showing what these places offer in the way of return trade; they also show samples of articles which are in demand in these localities and which are sold there by foreign competitors. These displays, arranged both geographically, by countries, and monographically, by products, offer an effective and rapid method for gauging foreign markets. The exhibits are supplemented by information as to origin, industrial value, use and price of each article displayed.

Commercial museums promote private enterprises only by acting as disseminators of mercantile knowledge.

**Special Knowledge Required.**—An essential condition for success in foreign markets is a knowledge of the customs, tastes and peculiarities of the people whom the exporter wishes to reach. If catalogues, circulars or price lists are sent out, they should be written in the language of the country for which they are intended, and the indications of weights and measures, as well as the quotations of prices, should conform to those used abroad.

**Packing.**—In packing goods the exporter should closely follow the instructions sent him, remembering that goods are liable to damage on long sea voyages, as well as because of rough handling in many localities where proper facilities for loading, unloading and transshipment do not exist.

**Marking.**—If there are many packages in a consignment, it is advisable to adopt a *distinctive mark*, placing this mark and a consecutive running number on each package; this permits a quick reassembling of goods should they become separated.

**Invoicing** should be very carefully done, because invoices must be presented to the customs-house officials abroad. A carelessly or improperly prepared invoice may prevent the entry of goods, thus creating delay.

All goods shipped abroad must be *cleared* at a customs-house, the owners, shippers, or consignors delivering to the collector of the port from which the goods are shipped *manifests* specifying the kinds, quantities, values and destination of the merchandise.

When the steamer is loaded the captain files with the collector a full and complete manifest, which contains a detailed list of each consignment composing the ship's cargo. This manifest, after it has been certified by the customs officer, is returned to the captain together with *clearance papers*.

**Tariff Legislation.**—The act of July 4, 1789, was the first tariff law enacted by Congress. Since then thirty-five principal tariff laws have been in force for various periods. The last law was approved August 4, 1909. The raising of revenue and the encouragement and protection of domestic manufactures has been the object of all these laws.



## DUTIES UNDER THE TARIFF LAW OF 1909 AND OF 1897 COMPARED

The following table covers only the articles of principal importance imported into the United States. ad val.—ad valorem; n. a. p. f.—not specially provided for; n. a.—not enumerated. All weights avoirdupois standard. Ton, 2,240 pounds.

ARTICLES	RATES OF DUTY UNDER		ARTICLES	RATES OF DUTY UNDER	
	Dingley Law of 1897	New Law of 1909		Dingley Law of 1897	New Law of 1909
<b>SCHEDULE A—CHEMICALS, OILS AND PAINTS</b>			<b>SCHEDULE G—Continued</b>		
Alcoholic compounds, n. a. p. f.			Fruits, apples, peaches	25c bushel.	25c bushel.
Alkalies, alkaloide, distilled oils, essential oils and all combinations of the foregoing	60c lb. and 45 p. c. ad val.	60c lb. and 25 p. c. ad val.	Fruits, preserved	2c lb.	2c lb.
Ammonia, carbonated	25 p. c. ad val.	25 p. c. ad val.	Fruits, prunes, grapefruit	1c lb.	1c lb.
Drugs	15c lb. and 10 p. c. ad val.	15c lb. and 10 p. c. ad val.	Fruits, lemons	1c lb.	1c lb.
Glass, value not above 15c per lb.	25c lb.	25c lb. and 20 p. c. ad val.	Fruits, pineapples in bulk	\$7 per 1,000.	\$7 per 1,000.
Oil, castor, gal.	35c gal.	35c gal.	Salt, in sacks and barrels	12c 100 lbs.	11c 100 lbs.
Oil, cod liver, gal.	15c gal.	15c gal.	Salt, in bulk	6c 100 lbs.	7c 100 lbs.
Oil, olive, in bottles, etc., gal.	50c gal.	n. a. p. f. 40c gal.	<b>SCHEDULE H—SPIRITS AND WINES</b>		
Oil, whale, gal.	8c gal.	8c gal.	Alcohol, proof, gallons	\$2.25 gal.	\$2.60 gal.
Opium, crude and not adulterated, containing 9 per cent ad val. of morphine, lbs.	\$1 lb.	\$1.50 lb.	Brandy, gin, whiskey, cordials, proof, gallons	\$2.25 gal.	\$2.60 gal.
Phosphorus, lbs.	15c lb.	15c lb.	Wines, champagne, quart.	\$8 per doz.	\$9.60 per doz.
Perfumery, cosmetics, containing alcohol	60c lb. and 45 p. c. ad val.	60c lb. and 50 p. c. ad val.	Wines, still, in cases	45c gallon.	45c gallon.
Perfumery, cosmetics, not containing alcohol	50 p. c. ad val.	60 p. c. ad val.	Wines, still, in bottles, quart.	\$1.60 per doz.	45c gallon.
Soap, Castile	15c lb.	15c lb.	Malt liquors, in bottles, gallon	45c gallon.	45c gallon.
Soap, perfumed toilet	50 p. c. ad val.	50 p. c. ad val.	Mineral waters, in bottles, quart.	30c doz.	30c doz.
Soda, bicarbonate of	5c lb.	5c lb.	<b>SCHEDULE I—COTTON MANUFACTURES</b>		
<b>WARE AND GLASSWARE</b>			Cotton thread, according to numbers, uncolored	3c lb. to 35c lb.	25c lb. to 25c lb.
Cement, Roman, Portland, in barrels and sacks, lbs.	8c 100 lbs.	8c 100 lbs.	Cotton thread, colored, bleached, according to numbers	6c lb. to 81c lb.	6c lb. to 67c lb.
Earthenware, porcelain, decorated	25 p. c. ad val.	25 p. c. ad val.	Cotton cloth, square yards	1c sq. yard to 8c sq. yard	1c sq. yard to 8c sq. yard
Earthenware, common	60 p. c. ad val.	40 p. c. ad val.	Cotton handkerchiefs	45c sq. yard and 10 p. c. ad val.	45c sq. yard and 10 p. c. ad val.
Glassware, plain and cut, decorated	15 p. c. ad val.	15 p. c. ad val.	Cotton clothing, ready made	50 p. c. ad val.	50 p. c. ad val.
Glassware, plain and cut, undecorated	60c cubic foot	60c cubic foot	Cotton hosiery, pairs	50c doz. to \$2 doz. & 15 p. c. ad val.	70c doz. to \$2 doz. & 15 p. c. ad val.
Marble, in block	50 p. c. ad val.	50 p. c. ad val.	Cotton shirts, drawers, dozen	60c doz. & 15 p. c. ad val.	60c doz. & 15 p. c. ad val.
Marble, manufactures of, except for jewelry	50 p. c. ad val.	50 p. c. ad val.	Cotton, flax, hemp and jute manufactures of	35 p. c. ad val.	35 p. c. ad val.
Sponges	8c ton.	8c ton.	Flax, yarn, 80s	\$3 ton.	\$3 ton.
Sumper, refined	3-10c lb.	3-10c lb.	Flax, straw	3c yard.	6c yard.
Sumper, ground			Mattings for floors	60 p. c. ad val.	60 p. c. ad val.
<b>SCHEDULE C—METALS AND MANUFACTURES OF</b>			Lace manufactures		
Iron ore, tons	40c ton.	15c ton.	<b>SCHEDULE J—WOOL AND MANUFACTURES OF</b>		
Iron in pipe, wrought and cast	6-10c lb.	6-10c lb.	Wool, class 1	10c lb. to 35c lb.	10c lb. to 35c lb.
Iron, bar	45 p. c. ad val.	45 p. c. ad val.	Wool, class 2	11c lb. to 35c lb.	11c lb. to 35c lb.
Cast iron pipe, lbs.	4-10c lb.	4-10c lb.	Wool, class 3	3c lb. to 7c lb.	3c lb. to 7c lb.
Nails, horseshoes	25c lb.	25c lb.	Blankets	22c lb. and 30 p. c. ad val.	22c lb. and 30 p. c. ad val.
Copper plates, lbs.	12c gross.	12c gross.	Blankets	7c lb. to 44c lb. and 55 p. c. ad val.	7c lb. to 44c lb. and 55 p. c. ad val.
Pans, metallic, except gold pens	40 p. c. ad val.	40 p. c. ad val.	Wool, sq. yard and 50 p. c. ad val.	7c sq. yard and 50 p. c. ad val.	7c sq. yard and 50 p. c. ad val.
Table and kitchen utensils, metal	35 p. c. ad val.	35 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Tin plates	35 p. c. ad val.	35 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Pins—not jewelry	45 p. c. ad val.	45 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Manufactures of			Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
<b>SCHEDULE D—WOOD AND MANUFACTURES OF</b>			Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Timber	1c cubic foot.	1c cubic foot.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Lumber, boards, planks, not planed	\$1 per 1,000 ft.	\$1 per 1,000 ft.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Lumber, finished on four sides	\$4 per 1,000 ft.	\$4.75 per 1,000 ft.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Staves	10 p. a. ad val.	10 p. a. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Shingles	30c per 1,000.	50c per 1,000.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Wood, manufactures of, n. a. p. f.	35 p. c. ad val.	35 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
<b>SCHEDULE E—SUGAR, MOLASSES AND MANUFACTURES OF</b>			Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Sugar (not above No. 16 Dutch standard), best	0.95c to 1.65c lb.	0.95c to 1.65c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Sugar (same) cane	0.95c to 1.75c lb.	0.95c to 1.75c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Molasses, not above 40 degrees	20 p. c. ad val.	20 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Maple sugar	15c lb.	15c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Glucose or grape sugar	15c lb.	15c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Sugar candy, valued at more than 15 cents per pound	50 p. c. ad val.	50 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
<b>SCHEDULE F—TOBACCO AND MANUFACTURES OF</b>			Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Tobacco, unmanufactured, lbs.	\$1.85 lb. to \$2.50 lb.	\$1.85 lb. to \$2.50 lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Snuff, lbs.	35c lb.	35c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Cigars and cigarettes	\$4.50 lb. and 25 p. c. ad val.	\$4.50 lb. and 25 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
<b>SCHEDULE G—AGRICULTURAL PRODUCTS AND PROVISIONS</b>			Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Cattle, one year old or over, valued over \$14 per head	27 1/2 p. c. ad val.	27 1/2 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Horses, mules, valued at \$150 or less	\$30 head.	\$30 head.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Horses, mules, valued at over \$150	25 p. c. ad val.	25 p. c. ad val.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Barley, bushel	30c bushel.	30c bushel.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Barley malt, bushel	45c bushel.	45c bushel.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Oats, bushel	15c bushel.	15c bushel.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Rye, cleaned, bushel	2c lb.	2c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Rye, bushel	10c bushel.	10c bushel.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Butter and cheese, and substitutes for	6c lb.	6c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Eggs, n. a. p. f., doz.	25c dozen.	25c dozen.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Hay	\$4 ton.	\$4 ton.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Honey	20c gallon.	20c gallon.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Potatoes	25c bushel.	25c bushel.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Peas, cut, flaked	25c bushel.	25c bushel.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Fish, mackerel, halibut, salmon, fresh	1c lb.	1c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.
Fish, smoked, salted	4c lb.	4c lb.	Wool, sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.	7c sq. yard and 10c sq. yd. and 55 p. c. ad val.

LIST OF DUTIES UNDER THE TARIFF LAW OF 1900—Continued

In the entire silk schedule the classification was so changed in the new law as to make tabulated comparison with the classifications under the Dingley law impracticable. In general, increases were made.

**NOTE**—After the tariff law of 1900 was passed, but before it was signed by the President, the following concurrent resolution regarding hides was adopted:

Hides of cattle, raw or unskinned, whether dry, salted, or pickled, shall be admitted free of duty; provided, that on and after Oct. 1, 1909, grain, haff or split leather shall pay a duty of 7½ per cent ad valorem; that all boots and shoes made wholly or in chief value from cattle hides and cattle skins of whatever weight, of cattle of the bovine species, including calfskins, shall pay a duty of 10 per cent ad valorem; that harness, saddles, and saddlery, in sets or in parts, finished or unfinished, composed wholly or in chief value of leather, shall pay a duty of 20 per cent ad valorem.

**HAWAII AND PORTO RICO.**—Articles of merchandise entering the United States from Hawaii and Porto Rico and entering those possessions from the United States are exempt from duty.

**PHILIPPINE ISLANDS.**—The act of Congress, approved August 5, 1906, provided (Sec. 3): "That there shall be levied, collected, and paid upon all articles coming into the United States from the Philippine Islands the rates of duty which are required to be levied, collected, and paid upon like articles imported from foreign countries, except all articles the growth or product of or manufactured in the Philippine Islands from materials the growth or product of the Philippine Islands or of the United States, or of both, or which do not consist of Philippine materials to the value of more than 50 per cent of the total value, upon which no drawback of customs duties has been allowed therein, coming into the United States from the Philippine Islands shall hereafter be admitted free of duty, except rice, and except, in the case of cigars, of 300,000 gross tons, wrapper tobacco and filler tobacco when mixed or packed with more than 15 per centum of wrapper tobacco in excess of 300,000 pounds, and except cigars of 1,000,000 pounds, and cigars in excess of 1,000,000 cigars; and that there shall be levied, collected, and paid, in the United States, upon articles, goods, wares, or merchandise coming into the United States, from the Philippine Islands, a tax equal to the internal-revenue tax imposed in the United States upon like articles, goods, wares, or merchandise of domestic manufacture."

TWELVE GREATEST SEAPORTS IN 1911

PORT	YEAR	ENTERED TONS	CLEARED TONS
New York.....	1910	13,042,818	12,541,903
London.....	1909	11,605,698	8,622,316
Antwerp.....	1909	11,007,689	11,894,492
Manchester.....	1909	11,061,041	11,247,191
Hongkong-Victoria.....	1908	10,052,992	10,039,857
Rotterdam.....	1908	8,944,911	8,002,307
Shanghai.....	1909	9,062,627	9,400,380
Liverpool.....	1909	7,747,994	6,593,094
Singapore.....	1908	6,984,980	6,948,225
Malacca.....	1908	5,697,000	7,575,000
Cebu.....	1908	5,227,286	6,543,225
Cardiff.....	1908	5,771,476	8,888,756

FOREIGN COMMERCE CLEARED AT PRINCIPAL PORTS

EUROPEAN PORTS	YEAR	IMPORTS	EXPORTS	TOTAL COMMERCE
<b>UNITED KINGDOM</b>		\$		\$
London.....	1909	1,000,746,471	569,256,326	1,570,002,797
Liverpool.....	1909	723,146,084	728,131,030	1,451,277,114
Bull.....	1909	192,857,434	131,606,638	324,464,072
Manchester.....	1909	140,853,270	70,875,748	211,729,018
Glasgow.....	1909	69,433,616	131,255,330	200,688,946
Southampton.....	1909	104,383,291	100,674,447	205,057,738
Birmingham.....	1909	28,454,366	28,454,366	56,908,732
Grimsey.....	1909	55,911,944	67,576,955	123,488,839
Leith.....	1909	66,470,244	29,619,599	96,089,843
Tyner.....	1909	41,032,293	47,189,950	88,222,243
Cardiff.....	1909	28,485,946	60,869,418	89,355,364
Bristol.....	1909	70,039,525	15,861,272	85,900,797
<b>GERMANY</b>				
Hamburg.....	1909	810,179,870	878,343,753	1,588,523,723
Bremen.....	1909	256,425,258	152,004,695	408,429,953
<b>NETHERLANDS</b>				
Antwerp.....	1909	529,026,422	444,845,196	974,871,618
<b>FRANCE</b>				
Marseilles.....	1909	288,433,096	256,220,417	544,653,513
Nantes.....	1909	289,914,564	248,384,473	538,299,037
Dunkirk.....	1909	135,891,586	30,176,638	166,068,224
Bordeaux.....	1909	73,045,326	76,368,427	149,413,753
<b>ITALY</b>				
Genoa.....	1908	151,710,829	69,792,702	221,503,531
<b>AUSTRIA-HUNGARY</b>				
Trieste.....	1908	116,320,212	103,253,438	219,573,650
Fiume.....	1908	26,780,000	36,519,000	63,299,000
<b>RUSSIA</b>				
St. Petersburg.....	1908	66,956,661	38,026,394	104,983,055
Riga.....	1908	34,455,366	61,781,287	96,236,653
Odessa.....	1908	23,993,158	32,945,524	56,938,682
Rosol.....	1908	41,809,548	8,984,140	50,793,688
Vladivostok.....	1908	25,712,127	2,312,172	28,024,299
Batoum.....	1908	4,909,492	15,788,267	20,697,759
<b>SPAIN</b>				
Batoum.....	1908	56,119,949	23,660,634	79,780,583
Bilbao.....	1908	13,990,149	11,091,781	25,081,930
<b>AMERICAN PORTS</b>				
<b>UNITED STATES</b>				
New York.....	1910	935,990,958	651,984,356	1,587,975,314
Boston.....	1910	129,096,184	70,516,799	199,612,983
New Orleans.....	1910	85,712,027	140,376,560	226,088,587
Gastonia.....	1910	2,488,006	173,178,962	175,666,968
Philadelphia.....	1910	69,253,451	73,296,343	142,549,794
Baltimore.....	1910	26,990,618	77,381,507	104,372,125
San Francisco.....	1910	49,370,643	31,180,760	80,551,403
Savannah.....	1910	2,855,237	63,428,155	66,283,392
Panama Canal.....	1910	29,910,491	30,121,004	59,931,495

FOREIGN COMMERCE CLEARED AT PRINCIPAL PORTS—Cont'd

AMERICAN PORTS CONTINUED	YEAR	IMPORTS	EXPORTS	TOTAL COMMERCE
<b>CANADA</b>				
Montreal.....	1910	\$107,728,050	\$77,501,549	\$185,229,599
<b>MEXICO</b>				
Tampico.....	1910	18,403,874	41,279,804	59,683,678
Yucatan.....	1910	34,355,892	17,766,826	52,122,718
<b>CUBA</b>				
Havana.....	1908	65,075,683	49,702,167	112,777,850
<b>ARGENTINA</b>				
Buenos Ayres.....	1909	232,572,301	167,018,648	399,590,949
<b>BRAZIL</b>				
Santos.....	1908	34,588,950	84,106,037	118,694,987
Rio Janeiro.....	1908	69,722,260	59,727,365	129,449,625
<b>CHILE</b>				
Valparaiso.....	1909	45,109,846	4,984,218	50,094,064
Iquique.....	1909	8,345,093	22,094,422	30,439,515
<b>URUGUAY</b>				
Montevideo.....	1908	34,919,864	30,908,320	65,828,184
<b>AFRICAN PORTS</b>				
<b>CHINA</b>				
Shanghai.....	1909	121,021,846	96,613,302	217,635,148
Yokohama.....	1909	68,238,184	102,171,228	170,409,412
Tientsin.....	1909	61,743,940	60,107,944	121,851,884
<b>BRITISH COLONIES</b>				
Singapore.....	1908	127,867,476	104,316,829	232,184,305
Calcutta.....	1908	143,518,832	214,911,262	358,430,094
Bombay.....	1909	131,101,402	136,569,751	267,671,153
<b>EGYPT</b>				
Alexandria.....	1909	96,504,572	128,246,006	224,750,578
<b>AUSTRALIA</b>				
Sydney.....	1908	92,884,457	120,399,408	213,283,865
Melbourne.....	1908	78,786,353	72,136,971	150,923,324

IMPORTS AND EXPORTS OF PRINCIPAL COUNTRIES

COUNTRIES	YEAR	IMPORTS	EXPORTS
<b>Argentina.....</b>	1909	\$292,160,000	\$383,443,000
<b>Australia, Commonwealth of.....</b>	1909	248,761,000	306,187,000
<b>Austria-Hungary.....</b>	1909	864,355,000	469,627,000
<b>Belgium.....</b>	1909	658,113,000	501,203,000
<b>Brazil.....</b>	1909	180,604,000	310,261,000
<b>Bulgaria.....</b>	1909	30,863,000	11,507,000
<b>Canada.....</b>	1909	258,218,000	242,604,000
<b>China, of Good Hope.....</b>	1909	66,721,000	225,255,000
<b>Chile.....</b>	1909	95,000,000	11,847,000
<b>Cape of Good Hope.....</b>	1909	254,626,000	178,565,000
<b>Denmark.....</b>	1909	151,661,000	118,697,000
<b>Egypt.....</b>	1909	109,885,000	128,995,000
<b>France.....</b>	1909	1,132,715,000	1,063,746,000
<b>Germany.....</b>	1909	1,854,839,000	1,560,631,000
<b>Greece.....</b>	1909	29,459,000	21,084,000
<b>India, British.....</b>	1909	417,799,000	485,779,000
<b>Italy.....</b>	1909	594,259,000	363,559,000
<b>Japan.....</b>	1909	195,754,000	204,167,000
<b>Mexico.....</b>	1909	77,939,000	115,989,000
<b>Netherlands.....</b>	1909	119,577,000	872,882,000
<b>Norway.....</b>	1909	95,747,000	60,936,000
<b>Portugal.....</b>	1908	72,638,000	30,739,000
<b>Russia.....</b>	1909	504,065,000	211,852,000
<b>Spain.....</b>	1909	165,492,000	159,410,000
<b>Sweden.....</b>	1908	163,194,000	129,181,000
<b>Switzerland.....</b>	1909	304,065,000	211,852,000
<b>United Kingdom.....</b>	1909	3,040,300,000	1,841,384,000
<b>United States.....</b>	1909	1,476,613,000	1,700,744,000
<b>Uruguay.....</b>	1909	38,430,000	47,347,000

Exports of Manufactured Products.

Materials for use in manufacturing and crude foodstuffs were for many years the principal articles of export, but their relative importance has been steadily diminishing, while the importance of finished and

partially finished product of manufacture has increased. Each year since 1891 the exports of manufactured products has fallen more than half the value of the total exports. In 1905 and 1906 they formed 60 per cent of the total. From

1907 to 1909 they have constituted 58 to 59 per cent. While the amounts exported are very large, the form a very small proportion of the total manufacture of the United States, being not more than 5 or 6 per cent.

## FOREIGN TRADE OF THE UNITED STATES

## EXPORT TRADE

ARTICLES—DOMESTIC MERCHANDISE	VALUES
<b>Agricultural Implements</b> .....	\$ 28,124,033
Aluminum and Manufactures of.....	1,837
Animals.....	17,447,735
Books, Maps, Engravings, and Other Printed Matter.....	7,088,994
Brass and Manufactures of.....	1,353,561
Breadstuffs, Cereals.....	23,427,992
Breadstuffs, Oats.....	794,367
Breadstuffs, Wheat.....	23,633,625
Breadstuffs, Wheat Flour.....	47,691,467
Cars, Carriages, and Other Vehicles and Parts of.....	20,630,859
Chemicals, Drugs, Dyes, and Medicines.....	21,415,935
Clocks and Watches, and Parts of.....	18,848,938
Coal, Anthracite.....	14,585,632
Coal, Bituminous.....	25,926,014
Copper Ore.....	1,304,887
Copper, Manufactures of.....	88,094,267
Cotton, Unmanufactured.....	450,447,243
Cotton, Manufactures of.....	23,397,097
Earthen, Stone and China Ware.....	901,537
Fertilizers.....	8,791,649
Fibres, Vegetable, and Textile Grasses, Manufactures of.....	6,849,250
Fish.....	9,652,008
Fruit and Nuts.....	19,885,554
Furs and Fur Skins.....	14,501,635
Glass and Glassware.....	2,905,401
Groceries or Grain Sugar.....	3,415,220
Hay.....	1,070,907
Hides and Skins.....	178,216
Hops.....	2,082,140
India Rubber, Manufactures of.....	10,175,634
Instruments for Scientific Purposes.....	12,535,618
Iron and Steel, Manufactures of.....	179,134,161
Leather, and Manufactures of.....	62,646,753
Malt Liquors.....	951,183
Marble, Stone, and Manufactures of.....	147,909
Musical Instruments.....	3,182,345
Naval Stores.....	16,681,962
Nickel, Nickel Oxide and Matte.....	4,512,367
Oil Cake, Oil Cake Meal.....	16,502,379
Oil, Animal.....	902,001
Oil, Mineral, Crude.....	8,577,181
Oil, Mineral, Refined or Manufactured.....	93,813,031
Oil, Vegetable.....	16,479,001
Paints, Pigments, and Colors.....	4,729,563
Paraffin, and Manufactures of.....	8,994,277
Paraffin, Paraffin Wax.....	7,886,359
Provisions, Beef Products.....	14,918,518
Provisions, Hog Products.....	91,415,894
Provisions, Olegmargarine.....	14,655,852
Provisions, Dairy Products.....	2,250,121
Seeds, Clover.....	832,676
Seeds, All Other.....	2,652,742
Soap.....	3,620,549
Spirits, Distilled.....	1,978,009
Sisal.....	1,274,773
Sisal, Leaves and Strap.....	2,474,978
Sugar.....	5,398,060
Tobacco, Unmanufactured.....	38,113,265
Tobacco, Manufactures of.....	4,805,101
Vegetables.....	4,207,319
Wood, and Manufactures of.....	78,813,903
Wool, and Manufactures of.....	2,369,283
<b>Total Exports, Domestic</b> .....	\$1,710,083,908
<b>Exports, Foreign Merchandise.....</b>	\$1,900,722
<b>Total Exports, Domestic and Foreign Merchandise.....</b>	\$1,741,984,630
Specie, Gold.....	\$ 118,380,215
Specie, Silver.....	55,286,861
<b>Total Exports, Domestic and Foreign.....</b>	\$1,915,834,709

## IMPORT TRADE

ARTICLES—MERCHANDISE	VALUES
<b>Animals</b> .....	\$ 7,839,670
Art Works.....	21,088,720
Books, Maps, Engravings, etc.....	6,653,973
Bricables.....	3,111,872
Chemicals, Portland, Hydraulic.....	802,843
Chemicals, Drugs, Dyes, and Medicines.....	2,592,920
Clocks and Watches, and Parts of.....	2,371,251
Coal Bituminous.....	4,600,019
Cereals, Crude, and Shells of.....	11,376,061
Coffee.....	69,194,353
Copper, and Manufactures of (not ore).....	30,887,841
Cork Wood, and Manufactures of.....	2,001,529
Cotton, Unmanufactured.....	15,816,138
Cotton, Manufactures of.....	66,473,114
Earthen, Stone, and China Ware.....	1,061,120
Fertilizers.....	11,992,653
Fibres, Vegetable, Unmanufactured.....	5,721,883
Fibres, Vegetable, Manufactures of.....	34,218,829
Fruits and Nuts.....	57,621,245
Furs and Manufactures of.....	37,424,827
Glass and Glassware.....	2,597,714
Glean and Glasses.....	6,553,754
Iron, Unmanufactured.....	1,091,478
Iron, Manufactures, and Materials for.....	7,690,530
Hides and Skins, Other Than Furs.....	11,247,836
India Rubber and Gums—Percha, Crude.....	106,861,496
Iron and Steel, and Manufactures of.....	39,502,472
Jewelry and Precious Stones.....	60,559,129
Lead, Ore, and Base Bullion.....	3,643,521
Leather, and Manufactures of.....	18,965,567

## IMPORT TRADE—Continued

ARTICLES—MERCHANDISE	VALUES
Malt Liquors.....	galls. 3,263,955
Meats and Dairy Products.....	11,043,454
Oil.....	24,299,586
Paper, and Manufactures of.....	11,503,680
Paper Stock, Crude.....	5,206,367
Silk, Unmanufactured.....	lbs. 4,367,527
Silk, Manufactures of.....	67,115,177
Spirits, Distilled.....	32,885,459
Sugar.....	13,671,648
Tin, in Bars, Blocks or Pigs.....	30,869,532
Tobacco, Unmanufactured.....	lbs. 4,087,567
Tobacco, Manufactures of.....	6,585,781
Toys.....	37,751,279
Vegetables.....	14,272,371
Wine.....	4,622,504
Wood, and Manufactures of.....	64,422,503
Wool, Unmanufactured.....	lbs. 51,220,544
Wool, Manufactures of.....	25,832,175
<b>Total Merchandise.....</b>	<b>\$1,817,819,988</b>
Specie, Gold.....	\$ 43,339,905
Specie, Silver.....	45,217,194
<b>Total Imports.....</b>	<b>\$1,646,377,087</b>

## UNITED STATES IMPORTS AND EXPORTS BY COUNTRIES

COUNTRIES	IMPORTS	EXPORTS
<b>Austria-Hungary</b> .....	\$ 17,408,910	\$ 14,962,731
<b>Azores and Madeira Islands</b> .....	96,875	184,234
<b>Belgium</b> .....	40,909,281	11,483,281
<b>Denmark</b> .....	2,198,324	13,644,903
<b>France</b> .....	122,363,346	117,827,466
<b>Germany</b> .....	168,806,237	249,555,926
<b>Gibraltar</b> .....	9,494	228,019
<b>Greece</b> .....	2,643,065	429,670
<b>Iceland, Ireland, etc.</b> .....	140,236	16,181
<b>Italy</b> .....	40,868,367	53,467,053
<b>Malta, Goro, etc.</b> .....	16,351	303,009
<b>Netherlands</b> .....	31,712,256	1,803,449
<b>Norway</b> .....	6,551,985	5,949,330
<b>Portugal</b> .....	6,507,723	3,223,855
<b>Russia</b> .....	36,181	10,186,150
<b>Russia in Europe</b> .....	10,186,150	10,789,930
<b>Spain</b> .....	4,067,008	4,273
<b>Sweden</b> .....	18,433,435	18,984,403
<b>Switzerland</b> .....	6,870,477	5,991,896
<b>Turkey in Europe</b> .....	25,209,159	756,770
<b>Great Britain and Ireland</b> .....	1,476,109	1,476,109
<b>Honduras</b> .....	271,029,772	503,532,871
<b>British North America</b> .....	591,123	1,322,959
<b>Newfoundland and Labrador</b> .....	1,066,409	1,211,852
<b>Central American States</b> .....	95,128,310	216,990,021
<b>Costa Rica</b> .....	1,299,658	4,074,802
<b>Guatemala</b> .....	3,641,298	3,050,510
<b>Honduras</b> .....	1,832,324	1,959,246
<b>Nicaragua</b> .....	2,012,225	1,603,449
<b>Panama</b> .....	1,321,767	1,690,762
<b>Salvador</b> .....	80,229,189	20,690,371
<b>Mexico</b> .....	1,176,381	1,316,957
<b>Miquelon, Langley, etc.</b> .....	58,795,943	58,193,704
<b>West Indies</b> .....	12,655	29,246
<b>British</b> .....	11,154,683	11,277,963
<b>Cuba</b> .....	122,838,037	52,858,158
<b>Danish</b> .....	403,926	740,174
<b>Dutch</b> .....	346,589	638,146
<b>French</b> .....	44,222	1,218,646
<b>Hayti</b> .....	790,579	4,498,449
<b>San Domingo</b> .....	2,402,716	3,106,402
<b>Argentine Republic</b> .....	33,464,966	49,464,966
<b>Bolivia</b> .....	189	603,721
<b>Brazil</b> .....	108,154,491	22,897,890
<b>Chile</b> .....	20,921,059	8,504,294
<b>Colombia</b> .....	138,141	3,979,886
<b>Ecuador</b> .....	2,859,714	2,415,951
<b>Guatemala</b> .....	567,793	1,884,331
<b>Honduras</b> .....	925,782	683,889
<b>Paraguay</b> .....	29,171	364,223
<b>Peru</b> .....	7,621,497	4,548,053
<b>Venezuela</b> .....	7,412,866	2,797,210
<b>Aden</b> .....	2,066,220	831,784
<b>Chinese Empire</b> .....	20,999,725	16,209,591
<b>British China</b> .....	36,146	3,492
<b>French China</b> .....	6,442	65,030
<b>Japanese China</b> .....	1,243,390	394,271
<b>British East Indies</b> .....	20,610	263,768
<b>Dutch East Indies</b> .....	10,651,896	9,498,016
<b>French East Indies</b> .....	7,433,231	17,882
<b>Hongkong</b> .....	2,333,231	6,467,165
<b>Japan</b> .....	66,391,991	2,959,210
<b>Korea</b> .....	20,176	442,066
<b>Manila</b> .....	683,371	499,178
<b>Persia, Asiatic</b> .....	1,181,625	1,019,881

## FOREIGN TRADE OF THE UNITED STATES

## UNITED STATES IMPORTS AND EXPORTS BY COUNTRIES—Continued

COUNTRIES	IMPORTS	EXPORTS	COUNTRIES	IMPORTS	EXPORTS
Siam.....	\$125,882	\$286,200	French Africa.....	\$726,970	\$1,275,393
Turkey in Asia.....	\$4,143,332	744,504	German Africa.....	433,098	200,465
Other Asia.....	3,495	149	Liberia.....	212	84,469
British Australasia.....	18,800,764	27,696,557	Madagascar.....	6,626	7,731
New Zealand, etc.....	4,168,125	5,577,098	Morocco.....	475,215	60,373
French Oceania.....	602,418	544,436	Portuguese Africa.....	228,666	1,138,775
German Oceania.....	38,270	116,374	Spanish Africa.....	.....	22,897
Philippine Islands.....	17,317,497	18,832,645	Turkey in Africa—Egypt.....	12,176,168	982,845
British West Africa.....	227,108	2,448	Tunisi.....	14	21,233
British South Africa.....	2,178,174	9,614,406	Total.....	\$1,507,819,968	\$1,744,984,730
British East Africa.....	469,377	601,134			
Candian Islands.....	125,958	294,749			

**Business Correspondence.**—Modern industrial and commercial activities are impossible without extensive correspondence. Millions of letters are daily exchanged; some of these do not leave the confines of a single factory or store, being used in interdepartmental relations; others cross continents and seas in order to bring together prospective buyers and sellers.

**Diversity of Letters.**—Letters of application for positions and letters of introduction, letters of inquiry and letters of information, letters ordering goods and those recinding orders, letters of complaint and letters adjusting differences, letters demanding payments and those accompanying remittances; these and an infinite variety of other kinds of communications are used in the daily routine of business.

The increasing complexity of business life, the ever growing dependence upon the goods and the services of others, have made correspondence one of the cornerstones of our civilization, and upon this art depends in many instances the success or the failure of a commercial enterprise.

**Distribution of Mail.**—In large business organizations the incoming mail is generally opened by the *receiving clerk*, who distributes it to the various departments. Many firms request that all communications should be sent to the company and not to any number or official thereof; in this case, all letters must go to some central point, the nature of the letter alone revealing for whom it is intended.

Letters must be answered promptly, then filed away for future reference. (See *Business Letters* under *Practical English*.)

**Mail Contracts.**—With regard to *contracts by mail*, it is necessary to remember that an offer may be withdrawn at any time before it has been accepted, but legally the offer is not withdrawn until a notice of the withdrawal reaches the other party. On the other hand, the mailing of a letter of acceptance completes the transaction; in this case the law considers that the post office is the common agent of both the seller and the buyer, and that as soon as the letter is mailed the contract of sale is complete.

**Telegrams.**—A telegram, being a quicker medium of communication, may be used advantageously to withdraw an offer made by mail. If a telegram is sent accepting a mail offer, there is no binding contract until the telegram reaches its destination.

**Advertising.**—The object of advertising is to attract the attention of the public to saleable commodities or to services, and to create a demand for these.

The forms which advertising assumes and the media which it uses vary with the character of the goods advertised and with the amount of money available for publicity purposes.

**The Advertised Article.**—Certain commodities are excluded from general advertising

either because they cannot be so advertised or do not need this kind of publicity. Most raw materials are included in this group. These materials are subdivided into comparatively few grades, and they are usually sold according to certain fixed standards to buyers whose chief consideration is the adaptability of the article to productive purposes. The number of these buyers is limited and they know definitely what they want. The owner of a sugar refinery or of a textile mill is governed in his purchases by the necessities of his establishment, and no amount of competitive advertising will sway him in his decision, which is based upon experience and business judgment.

**Implements and Machinery** are usually advertised in trade and technical journals or by means of circulars and catalogues. In most instances, the announcements merely state the character and the quality of the product and give the name of the selling firm.

**Finished Commodities** are the most widely, most persistently and most ingeniously advertised. The average final consumer seeks the greatest amount of physical or spiritual satisfaction with the least expenditure of money; he is undecided, open to suggestions, and it is in order to get his patronage that the bulk of advertising is carried on. This advertising uses every device known to the psychologist and to the printer, and its subtleness and aggressiveness grow from year to year.

**Advertising Media.**—The periodical press is the most important medium of modern advertising.

**The Daily Papers** are used extensively by local merchants, bankers, real estate agents, professional men, theater owners, etc.; however, they print also an ever increasing number of announcements of transportation companies and of manufacturers of certain goods, such as bread, fast foods, tobacco, automobiles, ready-to-wear clothing, etc.

**Magazines.**—The latter advertise more frequently in magazines of general circulation because their object is the creation of a national reputation and of a national demand, and this object can be more economically obtained by using weekly and monthly journals instead of advertising simultaneously in various local papers throughout the country.

Another advantage of magazine advertisements over those in newspapers lies in the fact that the first may be made more striking, more attractive, because they have at their disposal a better grade of paper and superior printing facilities.

**Occasional Literature.**—The distribution of occasional literature includes the sending out of typewritten or printed letters, of circulars, catalogues, calendars, handbills, booklets, and almanacs. In this connection, special firms furnish lists of addresses which they compile from local trade

directories, clipping bureau reports, mercantile agency books, etc.

**Outdoor Advertising.**—The most important forms of outdoor advertising are signboards, posters, billboards and street-cards. The greater part of this form of publicity is controlled by *bill posting* and *street-car agencies* which are organized into a national union and which prescribe certain definite rules for such advertising.

**By Sample.**—An effective though expensive publicity method is a house-to-house distribution of samples; this is of particular advantage when a new article of superior quality is placed on the market.

**Demonstrators.**—Somewhat similar in character is the work of demonstrators, who travel from town to town in order to show the patrons of the shops handling their articles the advantages of their goods.

**Advertising Managers.**—Some business men write their own announcements, but most of the present-day advertising is done by men trained for the work. All large firms have advertising managers who control this side of the business, subject to limitations imposed by the financial head of the concern.

**Advertising Agencies.**—The great number of advertising media, the difficulty of ascertaining which are the best for specific purposes, has called into existence advertising agencies. These agencies collect and systematize information concerning publicity channels and place this information at the disposal of those concerns which intrust them with the management of their publicity campaigns. They relieve their patrons of all the details of the work, writing advertising copy, making illustrations, selecting type and borders, drawing contracts with papers and magazines, etc.

**Advertising Rates.**—The price paid for advertisements in the periodical press is determined by the circulation of the periodical, as well as by the size and the position of the announcement. The rate charged for one page of magazine advertisement approximates \$1 per thousand circulation, higher class publications demanding a somewhat larger sum.

**Keying.**—Various methods are used in order to determine the results of advertising in different periodicals. This is called *keying*. Announcements are keyed by lightly modifying the given address, by employing department letters, or by requesting the reader to fill out a coupon and mail it to the advertiser.

**Salesmanship.**—The success of a business enterprise largely depends upon the efficiency of its *selling force*.

The main classes of salesmen are:

1. Clerks in retail stores.
2. Commercial travelers.
3. Correspondents intrusted with the writing of sales letters.
4. Itinerant specialty salesmen.
5. Peddlers and bucketmen.

**Personal Elements.**—A successful salesman should be a keen observer of human nature; in addition to a pleasing personality he should possess tact and perseverance. As he must often contend with exasperating circumstances, it is very important that he should be self-controlled. A salesman should be straightforward and not overcautious, remembering that it is not the quantity but the quality of talk which counts. He should dress neatly; the matter of personal appearance is of greater importance to a business promoter than to a huckster, but even for the latter a shabby or a ragged attire is not good stock in trade.

The present-day salesman is a product of schooling and of self-training. Many factories and department stores give their salespeople instructions in the principles of salesmanship and in the methods of applying their general knowledge to specific conditions.

**Special Requirements.**—A salesman should know the articles he handles, not alone their selling price, but their purpose, their superiority over other similar articles, durability, workmanship, finish, as well as all other facts which might interest the probable buyer. The well-informed clerk inspires his customers with confidence, and this is an important element in making sales.

People buy for various reasons; sometimes in response to dictates of judgment, sometimes of feelings and of emotions. The wide-awake salesman reads his customer and makes his appeal accordingly. **Commercial Travelers** represent either manufacturers or wholesalers; they usually operate from a central office, the sales manager being their directing force.

A sales manager should be one who has had extensive selling experience and who has "made good" while doing actual saleswork. He should know his salespeople and the territories which they cover; he should be able to advise them and to cooperate with them in all possible ways.

**Territory.**—In dividing the territory the most important considerations are the condition of transportation facilities, the number of commercial centers and the line of goods handled.

**Necessity of Judgment.**—Roadmen should exercise judgment in taking orders; they must understand the needs of their customers as well as the interests of the house they represent. A buyer who has been overstocked is not likely to forget the fact, nor to forgive the salesman responsible for it. The financial standing of the buyer must also be carefully considered, as extensive sales to undesirable customers lead to the canceling of orders by the credit department of the firm, thus causing many annoyances and frequently creating ill-feeling.

**Communication.**—The firm should always be advised where they may find its representatives, and it is the duty of the commercial traveler to keep his house informed of his whereabouts. It frequently happens that fluctuations in price take place, or the stock may be considerably reduced; these and other important data must be immediately communicated to the roadmen.

**Compensation.**—The compensation of the commercial traveler consists of a fixed salary or of a commission on sales; often a combination of salary and commission is used.

**Credit and Collections.**—Credit is the means which makes possible transactions

involving the transfer of commodities, services, or money for a future equivalent. It is estimated that over 90 per cent of modern business is conducted on a credit basis, the credit granted being in the form of either deferred payments or of loans.

**Deferred Payments.**—In merchandising deferred payments are exemplified by the shipment of goods on time terms by the manufacturer to the wholesaler, and by the wholesaler to the retailer, as well as by the "charge accounts" of the customer in the retail store.

**Bank Credit.**—Such credit is usually book credit, neither notes nor collaterals being demanded by the credit giver from the credit seeker.

The basis of such credit is the confidence which those who grant it have in the ability and the willingness of the debtors to meet their obligations at a stipulated future date. This confidence is derived from a more or less exact knowledge of the tangible and intangible assets of the credit seekers.

Capital, in its various forms, calculated at marketable value, represents the tangible assets, while the intangible assets include honesty and business efficiency of the debtor, as well as any patents, trademarks, franchises, etc., which may protect his enterprise from competition, thus giving it greater earning power and greater stability. However important the tangible assets may be, it is the intangible ones which are most carefully scrutinized by the credit man when he passes upon credit risks.

Most deferred payments represent short-time credit, which seldom exceeds three months. Inasmuch as a considerable discount is generally offered for cash, it is of great advantage to the merchant to be able to utilize as far as possible his own capital or his bank credit.

**Bank Loans** may be obtained at a smaller rate of interest than that which is charged for deferred payments. The bank loans either on the personal note of the borrower or on the pledge of collateral securities, such as stocks, bonds, etc. The note is signed either by the borrower alone, if his financial standing in the community warrants the bank to accept his "single-name paper," or it is indorsed by a second party, a business associate or a friend of the borrower (two-name paper). The bank loans also by discounting bills of exchange and other negotiable documents arising from ordinary business transactions.

**Credit Department.**—Every large concern has a credit department whose work is placed under the supervision of a credit man. In this department are gathered and classified all data pertaining to the financial standing of the firm's present and prospective customers.

The data are obtained from the following sources: Written and signed statements of those who apply for deferred payments; references given by them; reports sent by the commercial travelers of the house; bank references; personal interviews of the credit man with the credit seekers; rating books and special reports of the mercantile agencies; information supplied by the credit cooperative organizations.

**Credit Man.**—A good credit man should not only be able to analyze credit statements and balance sheets, but he should also possess the power of discrimination and of selection, the ability to read character as it is revealed by the customer's manner

of answering questions, by his past history, by his associates, by his methods of conducting business, etc.

It is easy to deny credit, but it should be remembered that denial of credit in most instances means loss of business, and the best credit man is not the one who is overcautious, but the one who knows how to bring to his house the greatest number of credit patrons with the least probability of incurring bad debts.

**Collections.**—In connection with sales on credit, accounts should be watched carefully and collections made regularly. Many accounts never reach a past maturity stage, for they are promptly paid by the debtors when due; others become delinquent, thus necessitating the services of the collection department.

In dealing with bad accounts one should carefully distinguish between those customers who are unmethodical or slow and those who are willfully negligent or insolvent. If letters reminding the debtor of his obligations fail, drafts are sent for collection to a bank or to an agency. Should this method of enforcing payment also fail, there remains but legal procedure. When this has been decided upon it should be pushed without delay. It presupposes the breaking off of all friendly relations with the debtor, and nothing is to be gained from dilatory measures.

**Transportation by Land and by Sea.**—Commerce measures distances not so much by miles as by what it costs to transport freight from one locality to another. The cost of transportation depends upon the condition of the roadbed, the effectiveness of the motive power and the serviceability of the vehicle.

Primitive methods for overcoming distances by means of beasts of burden or draft animals over unimproved highways are not only slow, insecure and irregular, but are also expensive, thus limiting the commercial intercourse between communities to the exchange of more or less valuable objects of an imperishable character.

At present wagon roads do not play an important rôle in long distance traffic, but as feeders of railways and as local lines of communication their economic significance is very great. The cost of wagon transportation is prohibitive on sand surfaces at some seasons, but even on the best macadamized road it is seldom less than 10 cents per ton mile, the average being about double this amount. The average railway rate in the United States is between eight and ten cents per ton mile, and the rate on the Erie canal about three mills.

**Railway Rates** are based upon the expenses incurred in transporting goods as well as upon the value of the service to the shipper and the nature of the article transported.

**Rate-Fixing.**—For the purposes of rate-fixing, commodities are grouped into a small number of classes, the rate being based upon class and not upon individual articles. Our interstate railway rates are governed by three classifications—the official, applying in the territory north of the Ohio river and east of the Mississippi river; the southern, being in force south of the Ohio and east of the Mississippi; and the western, governing the freight traffic west of the Mississippi river.

The Classifications are issued by committees composed of representatives from all the railroads operating in the territory covered by the classification; supplementing these are freight tariffs which specify the rates for the various classes of commodities and

which are published by each railroad independent of all others for its own use.

Many products which are invariably handled in carload lots, such as coal, grain, cement, etc., are not included in the classifications, but are given a special or a so-called *commodity rate*.

**Shipping.**—Common carriers require that goods delivered to them for shipment should be accompanied by a *shipping bill*, containing a list of the articles to be transported as well as directions concerning where and to whom the goods are consigned. Shipping clerks should be familiar with railroad routes, classifications and tariffs; inefficiency in the organization of the *shipping department* has cost many a firm large sums of money through errors in routing and through overcharges.

**Receipt and Bill of Lading.**—When goods are delivered to the railroad company a *receipt* is given the shipper. The receipt is usually exchanged for a *bill of lading*, issued by the railway freight agent. The bill of lading is forwarded by the shipper to the consignee. It is not only a railway receipt for the goods and a contract for their carriage, but it is also an evidence of ownership and a means for transferring the title to the goods. On the bills of lading are printed certain stipulations limiting the liability of the carrier; to illustrate, in case of freight being lost, the carrier is not liable but for losses due to its own negligence, and even in the latter case not unless the claim is made within a certain time limit.

**Way Bill.**—One of the most important shipping papers is the *way bill*. It is not given the shipper, but it accompanies his shipment usually in the possession of the conductor who has charge of the freight train. The way bill is used by the agent at destination as a guide in collecting charges and by the central office in checking agents' reports.

**Notice on Freight Bill.**—As soon as the freight arrives at its terminal a notice is sent to the consignee. Upon the payment of the freight charges the railroad surrenders the goods and delivers a receipted *freight bill*, the transaction thus being brought to an end.

**Water Transportation.**—The ocean affords unrivaled opportunities for the use of large vehicles and powerful motors; it therefore permits the utmost utilization of both carrying space and propelling force; this results in a comparative cheapness of *ocean freight rates*. These rates are considerably less than railway charges, not only because it costs less to give the service but also because of the fact that rate agreements and combinations are more easily effected by railway organizations than by steamship companies.

An important fact to be considered is that in water transportation the vehicle is the carrier's chief item of expense, the roadway being provided by nature and the terminal facilities by municipalities, states or independent corporations.

**Ocean Commerce** is carried on by means of *steamers* and of *sailing vessels*. The respective position of each may be judged from the following figures: In 1904-5 the gross tonnage of sea-going steamers was 27,900,000 tons, that of sea-going sailing ships 7,512,000 tons. These data do not show the exact proportion of the work done by the two carriers, the steamer traveling and delivering cargoes with greater rapidity than the sailing vessel, whose movements are dependent upon winds and other natural conditions.

The comparative efficiency of the two is usually placed as four for steam and one for sail. Only about 5 per cent of the world's shipping is carried by sailing vessels.

Steamship transportation is divided into regular (line) traffic and irregular (charter) traffic.

**Line Traffic** implies a prearranged schedule of fixed sailings to definite ports and is made possible only by a large and continuous volume of trade. Line traffic is maintained by three kinds of vessels: by fast express steamers which carry only passengers, mail and parcels; by steamers of more moderate speed transporting both passengers and freight, and by boats which handle only freight. The equipment and the maintenance of line traffic is expensive and only the large commercial ports of the world can command such a service.

**Charter Traffic.**—Much of the heavy and bulky freight of commerce is carried by cargo boats operated as individual units, these boats being chartered as the occasion warrants; the traffic carried on by such vessels is known as *charter traffic*. Ports whose shipments are irregular depend almost entirely upon this kind of transportation.

Negotiations for the hire of single vessels, often called *tramps*, are usually made through *ship-brokers*, whose function is to provide cargoes for ships and ships for cargoes. These brokers may be found in most parts of the world.

Boats are chartered either for a single trip or for a certain length of time, *voyage charters* being much more numerous than *time charters*.

The contract whereby the merchant hires the vessel is known as the *charter party*, and in case of a trip charter it contains various agreed-upon conditions as to voyage, cargo, freight rate, time allowed for loading and unloading, etc. If the cargo is kept in the port longer than the *lay days* permit, the owner is entitled to an indemnity, usually provided for in the charter party and called *demurrage*. A charter party is supplemented by *bills of lading* acknowledging that the goods for the carriage of which the vessel was hired were received on board ship; bills of lading give effect to the various provisions of the charter.

**Corporation Economies.**—Of the three forms of business organization, individual ownership, partnership and corporation, the last is best suited for conducting large industrial and commercial enterprises.

**Individual Ownership** limits the amount of capital and credit a business unit may command; it also makes the single owner liable to the full extent of his possessions for the failure of the venture; because of this, individual ownership at present is confined almost exclusively to retail trade, to repairing industries and to farming.

**A Partnership**, through combination of capital and labor, makes larger enterprises possible but it greatly increases the individual liability of those who are associated in this way; each partner becomes personally liable not only for his own acts, but also for the acts of all other members of the firm. A partnership possesses another disadvantage which prevents it from meeting many important requirements of modern business; it is dissolved by the death or by the withdrawal of one of its members as well as by the addition of a new partner. Each

dissolution necessitates a readjustment of all titles, rights, assets and liabilities.

**A Corporation** has none of the aforementioned disadvantages; its existence is continuous and distinct from the persons forming it; its capital is divided into shares and the liability of the stockholders is limited to the amounts they have actually invested in the business. The control of the corporation is vested in the directors and other officers, who alone can act for the concern; this leads to greater efficiency through concentration of power and does away with complications and uncertainties which might arise should individual stockholders be permitted to involve the organization. The division of corporation capital into shares affords opportunities to both small and large investors, and the transferability of the securities makes it possible for the stockholders to join or to leave the undertaking at any time.

In the public mind, corporations are frequently associated with the idea of monopoly, but it should be remembered that not every incorporated business of large magnitude is a monopoly. Huge department stores working as corporations must continually face competition, and this is true of most of the steamship companies and of many manufacturing establishments.

**Monopoly** means a control over the supply of goods or services, not necessarily an absolute control, but one sufficiently powerful to permit the fixing of prices.

Excessive competition among industrial and railway companies caused many of them to enter into temporary agreements regulating prices, dividing territory, etc. These agreements were known as *pools*.

**Pools.**—In railway transportation, pooling consisted in apportioning either the competitive traffic or the receipts from this traffic; divisions were made according to stipulated ratios. In manufacturing agreements usually entered into were those limiting the annual output to a certain percentage of the producing capacity of the various establishments; if a factory produced and sold in excess of the stipulated amount, its owner was obligated to contribute a part of his earnings to the pool, the money to be distributed among those who made less than their share of production.

The successful management of a pool is very difficult, as its agreements can not be enforced. In the United States pools were declared illegal, being "in restraint of trade." They were succeeded by trusts.

**Trusts** are combinations by means of which the stockholders of competing corporations assigned their shares in trust to a committee (a board of trustees), receiving trust certificates instead. The earnings of the various companies are combined and each company receives its proportionate share of profits in accordance with the number of certificates it owns. At present the term "trust" is often erroneously applied to any combination which is capable of dominating a given branch of industry.

**Holding Company.**—The hostile attitude of our courts toward pools, as well as toward consolidations in the form of trusts, has led various competing companies into forming single large corporations; thus corporations have been established not only for the purpose of securing the economies of large scale production, but also in order to obtain a monopolistic control over the market. In many instances this result has been accomplished by forming a hold-

**ing company.** A holding company requires a controlling interest in several corporations by purchasing the majority of their stock. Identical in structure with ordinary corporations, it differs from them in that it is organized for the express purpose of holding stock, and by this means shaping the business policy of subsidiary concerns.

**Stock.**—The stock of a corporation is usually divided into *preferred* stock and *common*

stock. The holders of preferred stock are entitled to a certain percentage of the profits (ordinarily from 6 to 7 per cent) prior to the distribution of dividends among the holders of common stock. There are two kinds of preferred stock, *cumulative* and *noncumulative*. The advantage of the cumulative stock is suggested by its name. Should the annual profits of a corporation be insufficient

to pay the stipulated interest to the holders of the cumulative stock, the deficiency must be made good by the corporation out of future earnings, if any.

**Bonds.**—A distinctly different class of corporation securities are *bonds*, which are issued as certificates of indebtedness and may be regarded as promissory notes of a corporation, usually payable in from twenty to thirty years.

### THE RAW MATERIALS OF COMMERCE

The most important commercial products are summarized in the following pages. The materials are grouped according to their source: thus all the many products of the cotton plant are treated under one head; and since cotton fiber is the most important product of this plant, it is placed under the general heading of vegetable fibers, even though it supplies oil, cattle food and other articles.

Countries of production are mentioned in the order of their relative importance. This changes from year to year, due to many causes; thus a lessened production may be occasioned by unfavorable seasons, insect ravages, wars, or other influences, while production may increase on account of better transportation facilities, the opening up of new areas or the development of new demands for certain products.

In determining the relative importance of the different countries of production the average has been taken for a number of years, since 1900.

### FOODSTUFFS

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Wheat</b> is the seed of a grass ( <i>Triticum sativum</i> ). Fr., <i>Froment</i> ; Blt.; Ger., <i>Weizen</i> ; Sp., <i>Trigo</i> .	Its commercial varieties, hard, soft, red, white, etc., differ in percentage of starch and gluten. The whole grain is ground into <i>grains flour</i> , made into <i>breakfast foods</i> and used in brewing. From parts of the grain are prepared <i>whole wheat flour</i> , <i>white flour</i> , <i>middlings</i> , <i>bran</i> , <i>wheat grits</i> , <i>wheat starch</i> , <i>macaroni</i> , <i>spaghetti</i> , etc. Wheat straw is plaited into braids (leghorns, etc.) for hat making, and is used like the straw from other grains for packing material and as bedding for animals.	Grows in temperate climates, the largest crops being raised in United States (especially in Minnesota, North Dakota, Ohio, South Dakota, and Kansas); Central Europe (Russia, France, Austria-Hungary and Italy); India, Argentina, Canada and Australia. The area of wheat production is steadily increasing and wheat raising has become an important industry in newly developed countries, such as parts of British America, West Australia and Manchuria. The United States is the chief exporter of flour.	Wheat flour may be said to be the standard foodstuff of modern civilized man. In the modern flour mill, heavy rollers of steel or porcelain have replaced the old-style millstones. The bran, middlings and flour are separated by sieves, the finest being of silk bolting cloth. Macaroni is made from special varieties of hard, glutinous wheat. The principal countries exporting wheat are United States, Russia, Argentina, Canada, Roumania, and Australia. Straw braids come largely from Italy, China and Japan.
<b>Barley</b> is the seed of a grass ( <i>Hordeum sativum</i> , variety <i>vulgare</i> , etc.). Fr., <i>Orge</i> ; Ger., <i>Gerste</i> ; Sp., <i>Cebada</i> .	It is used chiefly in brewing and for horse feed; also in soups. Pearl barley, <i>barley flour</i> , malt, <i>beer</i> and <i>alcohol</i> are its chief products.	Cultivated chiefly in north and central Europe, the colder parts of Asia and North America.	Malt is made by moistening barley and allowing it to sprout in a dark room. The principal commercial starch is derived into dextrine and maltose. On fermentation, maltose produces alcohol. Pearl barley is prepared by removing the hard outer coats of the grain.
<b>Rye</b> is the seed of a grass ( <i>Secale cereale</i> ). Fr., <i>Seigle</i> ; Ger., <i>Roggen</i> ; Sp., <i>Ceneno</i> .	It is used in the form of <i>rye flour</i> and for distilling whisky and vodka. Rye straw is plaited into hat braids.	Cultivated in the cold climates of northern Europe, especially in Russia. Only small amounts are grown in the United States.	Rye flour is the chief breadstuff in parts of Russia, Scandinavia and Germany. Whisky is distilled from fermented rye and corn.
<b>Oats</b> is the seed of a grass ( <i>Avena sativa</i> ). Fr., <i>Avoines</i> ; Ger., <i>Hafer</i> ; Sp., <i>Avenas</i> .	Used chiefly for horse feed, and in lesser amounts for making oatmeal and breakfast foods.	Grown in largest amounts in Russia and the United States (especially Illinois and Iowa). Cultivated throughout the temperate parts of the civilized world.	The manufacture of oatmeal is of relatively small importance since the more nourishing products of wheat are increasingly used.
<b>Corn, Maize or Indian Corn</b> ( <i>Zea mays</i> ) belongs to the grass family. Flint, dent, sugar, soft and pop corn differ in percentage of starch and gluten, and the grain may be white, yellow, red or black in color. Fr., <i>Blé</i> ; Grain; Ger., <i>Getreide</i> , <i>Korn</i> ; Sp., <i>Grano</i> .	Among the dozens of useful products made from corn are <i>corn meal</i> , <i>corn grits</i> , <i>hominy</i> , <i>breakfast foods</i> , <i>beer</i> , <i>whisky</i> , <i>alcohol</i> , <i>condensed apricots</i> , <i>corn starch</i> , <i>dextrine</i> , <i>glucose</i> , <i>grape sugar</i> , <i>corn sirup</i> , <i>corn oil</i> , <i>soup</i> , <i>rubber substitute</i> and <i>cattle foods</i> . A special variety of corn is raised to make <i>cob pipes</i> . Compressed <i>corn pulp</i> is packed between the double hulls of wraps. Corn husks are used in <i>mattresses</i> and <i>paper</i> is made in very limited amount from the leaves and stalks. Large amounts of <i>popcorn</i> , corn plant and candied, are eaten in the United States.	Corn is the most valuable farm crop of the United States. The chief corn growing states are Illinois, Iowa, Kansas, Nebraska and Missouri. The bulk of the world's production of maize is grown in this country, although it is an important crop in Hungary, Italy, Egypt, South Africa, and other parts of the world.	Corn is of primary importance as a food for live stock; enormous quantities being used to fatten cattle and swine. The manufacture of starch and other products from corn is an industry of increasing magnitude. The chief starch derivatives are <i>dextrine</i> and <i>glucose</i> or <i>grape sugar</i> (used in brewing and as a substitute for rice sugar). Corn oil may be called a by-product in starch manufacture, yet the actual value of corn oil is greater than that of cornstarch produced in the United States. It is used in soap and paints. Vulcanized by heating with sulphur, it forms a widely used adulterant and substitute for rubber. It is estimated that one-third of the people of the world live principally on rice.
<b>Rice</b> is the seed of a grass ( <i>Oryza sativa</i> ). Fr., <i>Riz</i> ; Ger., <i>Reis</i> ; Sp., <i>Arroz</i> .	<i>Rough rice</i> and <i>clean rice</i> are the common commercial articles. <i>Rice polish</i> , <i>said</i> or <i>rice wine</i> , <i>rice straw</i> and <i>rice paper</i> are of lesser importance. Rice, steamed and swailed, is now extensively used as a breakfast food.	It is usually grown in swampy land or else on irrigated fields. In most countries, rice is grown in the most primitive fashion. Immense irrigating plants and modern agricultural machinery make possible the large production in parts of the United States. It is the chief crop in southeastern Asia, from India through Indo-China, a great part of China, southern Japan and many islands of the Pacific. Rice of excellent quality is raised in Texas, Louisiana and South Carolina, and an amount about equal to the production of this country is imported from eastern Asia.	<i>Rough rice</i> or <i>paddy</i> (rice in the hull) is first boiled by machinery and then the grains are polished or whitened. The <i>rice polish</i> , which consists of the powdered outer coats, is an important cattle food. <i>Said</i> , the national drink of Japan, is a weak alcoholic liquor brewed from rice. Rice straw is of enormous use in Asia, being employed for hundreds of purposes, some of them as in used equal to that in the making of bags, ropes and sails.
<b>Millet and Sorghum</b> are cultivated grasses of many varieties ( <i>Panicum</i> , <i>Setaria</i> , <i>Andropogon</i> , etc.). Fr., <i>Millet</i> ; Ger., <i>Hirse</i> ; Sp., <i>Mijo</i> .	Guinea corn, <i>kaffir</i> corn, <i>broom corn</i> and other names are employed to distinguish the different kinds.	These grains are grown in practically all parts of the world. In Europe and America they are important chiefly as fodder plants, although in many other parts of the world the seeds are used as human food.	In some places the juice of sorghum is boiled down to make <i>sirup</i> or <i>sugar</i> . Common brooms are made of the tops of certain varieties of sorghum ( <i>broom corn</i> ). These grains are mainly of local importance.



1. Early Hesperian.  
2. Corrie Casanberry.  
3. Coral.  
4. White Pineapple.  
5.

6. 15. Yellow Pina.  
7. Robertson.  
8. Cherry Currant.  
9. Yellow.  
10. German Crown Pines.  
11.

12. Egg Pina.  
13. Green Mignon.  
14. Amber Cherry.  
15. Pear.  
16. Perfumed Cherry.  
17.

18. Yellow Heart.  
19. Winter Apple.  
20. Green Apple.  
21. Average Pear.  
22.

23. Mignon Fruit.  
24. Mignon Fruit—Cross Section.  
25. Mignon Apple.  
26. Fresh Nectarine.  
27.

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## FOODSTUFFS—Continued

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Buckwheat</b> ( <i>Fagopyrum esculentum</i> ) is regarded as a cereal because its seeds are used like those of wheat, rye and other grains. Fr., <i>Sarrasin</i> ; Ger., <i>Buchweizen</i> ; Sp., <i>Trigo sarraceno</i> .	The seeds are ground into buckwheat flour. Buckwheat fields are especially attractive to bees and a fairly important source of honey.	Buckwheat cultivation has decreased in recent years. New York and Pennsylvania produce the greater part of a crop in the United States. Abroad it is raised chiefly in Russia, France and Japan.	Buckwheat flour is less used than formerly. Very little of this grain enters into foreign trade.
<b>Hay</b> is made from many grains and leguminous plants. Fr., <i>Foin</i> ; Ger., <i>Heu</i> ; Sp., <i>Heno</i> .	Timothy, clover and alfalfa are the chief sources of hay in the United States.	It is produced almost exclusively in temperate climates. Its yearly value in the United States is almost equal to that of the wheat crop.	Hay is most important in the cattle raising sections of the world. Some dried hay is exported to Europe and a little is sent to the tropics.
<b>Starch</b> is prepared from many seeds and roots. The common starches are from corn, wheat, rice, potatoes ( <i>Solanum tuberosum</i> ), cassava ( <i>Manihot utilissima</i> ), arrowroot ( <i>Maranta arundinacea</i> ) and the pith of the sago palm tree ( <i>Metroxylon</i> sp.). Fr., <i>Amidon</i> ; Ger., <i>Stärke</i> ; Sp., <i>Almidón</i> .	Starches appear on the market in powder, lump, flake and pearl forms. Starch grains differ in size and shape according to their source so that it is not difficult under a microscope to identify the various kinds. Glucose, dextrine and alcohol are made from starch.	For industrial purposes starch is prepared chiefly from potatoes in Europe and from corn and potatoes in the United States. Cassava is a very important foodstuff in almost all parts of the tropics. Many starches are of great local importance, such, for example, as taro in Hawaii. Comparatively few enter into general commerce.	In general, starches are separated from roots or seeds by grating them and washing with water. The starch grains are carried off in suspension and later separated from the water. Starch and starched foods are of the greatest importance to men and animals. Aside from the manufacture of glucose, dextrine and alcohol, starch is used for making yarn, cloth and paper, for making paste and laundry purposes. Tapioca comes on the market chiefly from Brazil and Straits Settlements. Arrowroot starch is produced in Bermuda, St. Vincent and Jamaica. Sago is exported from Straits Settlements.
<b>Vegetables</b> of an almost infinite variety are used in all parts of the world. Many of these are roots, some seeds, some leaves or other parts of plants.	The bulk of the crop is consumed fresh, although beans, peas, etc., are dried and increasing amounts of vegetables are canned or otherwise preserved.	The largest cultivation of fresh vegetables is as a rule near great cities.	Vegetables are so heavy in proportion to value that they are not normally shipped long distances. Potatoes and onions, being least perishable, are most important in general commerce. Better transportation facilities naturally increase the trade in both fresh and canned vegetables.
<b>Fruits</b> , like vegetables, are used in great variety. Those deserving special mention are: <b>Apple</b> ( <i>Pyrus malus</i> ).—Fr., <i>Pomme</i> ; Ger., <i>Apfel</i> ; Sp., <i>Manzana</i> . <b>Plum</b> ( <i>Prunus domestica</i> ).—Fr., <i>Prune</i> ; Ger., <i>Pflaume</i> ; Sp., <i>Ciruela</i> . <b>Grape</b> ( <i>Vitis</i> sp.).—Fr., <i>Raisin</i> ; Ger., <i>Weinbeere</i> ; Sp., <i>Uva</i> . <b>Orange</b> ( <i>Citrus aurantium</i> ).—Fr., <i>Orange</i> ; Ger., <i>Orange</i> ; Sp., <i>Naranja</i> . <b>Banana</b> ( <i>Musa sapientum</i> ).—Fr., <i>Banane</i> ; Ger., <i>Banana</i> ; Sp., <i>Banana</i> , <i>Guineo</i> . <b>Date</b> ( <i>Phoenix dactylifera</i> ).—Fr., <i>Datté</i> ; Ger., <i>Dattel</i> ; Sp., <i>Dátil</i> . Many others are of almost as great value.	Large quantities of dried and evaporated fruits are produced, among which are apples, apricots, plums (prunes) and grapes (raisins). Canned fruits, jellies, syrups, wines, liquors and vinegars are manufactured.	Different fruits thrive in different climates. Apples are mostly raised in temperate regions, the largest production being in the northern United States and parts of Canada, France, Italy and Spain, the greatest grape-growing countries, are the largest producers of wine.	Refrigerator cars and special steamers make possible the shipment of fresh fruits to parts of the world distant from the region of production. Apples are picked when ripe and dried apples from the United States and Canada to England and the Continent. Australia and South Africa are increasing their export of dried fruit. Prunes, raisins and other dried fruits are shipped to all parts of the world from California and Mediterranean countries. Bananas, oranges and pineapples are the chief tropical fruits in general commerce. Florida and southern California, with the West India, Central America and northern South America, supply the markets of the United States. Those used in England and northern Europe come from the Canary Islands and the West Indies. Dates come chiefly from northern Africa and western Asia.
<b>Sugar</b> is obtained from the juice of the sugar cane ( <i>Saccharum officinale</i> ) and from the juice of the sugar beet ( <i>Beta vulgaris</i> ). Fr., <i>Sucre</i> ; Ger., <i>Zucker</i> ; Sp., <i>Azúcar</i> . Maple sugar is from the juice of the sugar maple tree ( <i>Acer saccharinum</i> ). Sugar and sirup are made also from the juice of several palm trees.	Pure cane and beet sugar are in every way identical. Raw cane sugar, brown to yellowish in color, produced by evaporation of the juice in open pans (muscovados), and crystals from vacuum pans are both important commercially. The price of raw sugar is determined by its purity as shown on chemical analysis. A fairly good indication of purity is found in color, and raw sugars are graded according to an accepted standard which is set by the Dutch government. White sugar, granulated, loaf and pulverized, as commonly sold, is more nearly chemically pure than most other articles of commerce. Molasses, from cane juice boiled in open pans, is palatable for human food, and, like all cane molasses, is fermented and distilled to make rum. Molasses from vacuum pans (whether from cane or beet juice) is not pleasant in taste, but is an important food for cattle and is distilled to make alcohol.	Sugar cane is grown in India, Cuba, Hawaii, Java, Brazil, Mauritius, Louisiana and other parts of tropics and sub-tropics. India's large production is consumed locally and enters little into export trade. Sugar beets are grown most extensively in Germany, Austria, Russia, France and United States. More than half of the world's supply of sugar (exclusive of India) now comes from the sugar beet. Sugar cane is harvested by hand, no satisfactory machinery having been devised for cutting the canes in the field. Economic modern processes necessitate the building of enormous mills and the manufacture of sugar on a very large scale. A factor of great importance in this has also been the production of sugar from beets, grown on the farms of the temperate zone, close to the point of consumption. Here the refuse or pulp from the beets, along with the molasses, is promptly used for stock food.	After harvesting, sugar cane is carried (usually by rail) promptly to the mill, where the juice is pressed out. Modern mills have nine rollers, arranged in three sets. The trash, or bagasse, is almost dry when it leaves the last rollers and is used as fuel to run the mill. The juice is boiled down, generally in vacuum pans heated by steam, and the sugar crystals which form are separated from the molasses in centrifugals. Sugar beets are sometimes stored for several months before being used. The juice is commonly attracted by diffusion; that is, the beets are sliced and soaked in warm water. The sweet liquid is then treated in practically the same way as raw juice. Raw sugar is refined or purified by dissolving in water, treating it with lime and the serum of blood, filtering through animal charcoal and recrystallizing. The large sugar refineries are located in the United States and Europe. Sugars from the maple and the palm are produced only in small amounts and are of only local value. Sugar of milk is of some importance medicinally and industrially.

## FOODSTUFFS—Continued

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<p><b>Alcohol</b> is formed as a result of the fermentation of sugar and is therefore obtainable from practically any fruit or from any starchy matter through conversion of the starch into sugar.</p> <p>Alcohol is also a product of wood distillation.</p> <p>Fr., <i>Alcool</i>; Ger., <i>Weingeist</i>; Sp., <i>Alcohol</i>.</p>	<p>Alcohols differ in chemical composition according to the source. Grain alcohol, denatured alcohol and wood alcohol are the chief commercial types.</p>	<p>All parts of the world make and use alcoholic liquors. Distilled liquors contain more alcohol than fermented drinks. Wood alcohol and denatured alcohol are finding an increasing use for many industrial purposes in Europe and America, largely because of the lessened tax on their production.</p>	<p>Grain alcohol is distilled from fermented grain, chiefly Indian corn, in the United States.</p> <p>Potatoes are the most important source of alcohol in Germany. For industrial purposes it is denatured, or rendered unfit for use as beverage, by the addition of substances which give it an objectionable taste, odor or color. Alcohol finds a large use for heating and lighting and the development of power in alcohol motors. In these uses Europe leads. It is employed also in the manufacture of artificial silk, other, paints, varnishes and hundreds of other products.</p>
<p><b>Tea</b>, as it appears in commerce, is the prepared leaves of a bush or small tree (<i>Thea chinensis</i>). Fr., <i>Thé</i>; Ger., <i>Thee</i>; Sp., <i>Te</i>.</p>	<p>Tea is classed commercially according to the district of production as China, Ceylon, India, Assam, Japan, Formosa, Java, according to the method of preparation giving sun-dried, pan-fired, basket-fired; (a) green—Gunpowder, Imperial, Hyson, Caper, etc.; (b) black—Pekoe, Oolong, Pouchong, Congou, etc., and according to the quality, depending chiefly on the age of the leaf.</p> <p>Black tea is commonly of low grade and not salable in the United States. It is made from tea dust and sweepings or from large leaves and trash. It has a large sale in Tibet and Russia.</p> <p>Soluble tea, or tea extract, and soluble tea are not of great commercial importance.</p> <p>The commercial varieties of coffee are named according to the districts of production, and to a very considerable extent these names when so applied indicate flavor (Mocha, Java, La Guayra, Santos, Rio, etc.). Such names as Mocha and Java, indicating high-grade coffees, have in the past been applied to beans from other localities, but this practice has been stopped in the United States by recent pure food laws.</p> <p>Coffee extract is prepared for sale to only a small amount.</p> <p>The popularity of coffee is due to the fact that, like tea and chocolate, it contains caffeine, a mild stimulant.</p>	<p>Tea is grown chiefly in hilly country throughout eastern and southern Asia, China, Ceylon, India, Japan and Java are the chief producing countries. The cultivation of the tea plant requires great care to produce leaves of perfect quality, young, tender and fragrant. The very youngest leaves and leaf buds, when properly prepared, sell for the highest price. In some places tea is picked only once or twice a year, while in other countries, where the climate is favorable to rapid growth of tea shoots, the pickings are very frequent.</p>	<p>Green and black teas are made from leaves of the same species of plant. For black tea the leaves are allowed to wither and ferment slightly before being dried, usually over a charcoal fire. Green teas are prepared by drying the leaves more quickly and not allowing them to ferment.</p> <p>Tea is popular because of its pleasant taste and stimulating quality (due to the thein, or caffeine, which it contains). Outside of tea producing countries, the chief consumers are English-speaking people. The United Kingdom buys about half of all export tea, chiefly from Ceylon, India, Formosa and China. The United States uses more green tea than any other country, much of our supply coming from Japan, Formosa and China. Much Chinese tea is exported overland to Russia.</p>
<p><b>Coffee</b> is the seed of a small tree. The world's supply of coffee is produced chiefly by the species of tree which was originally native in Abyssinia and cultivated in Arabia (<i>Coffea arabica</i>). The Liberian coffee tree (<i>C. liberica</i>) is cultivated to a limited extent. Fr., <i>Café</i>; Ger., <i>Kaffee</i>; Sp., <i>Café</i>.</p>	<p>Cacao beans are classified commercially according to the place of origin as San Thomé, Bahia, Esmeralda, Guayaquil, Mexican, etc., and according to the method of drying (as fermented (rotted) or unfermented).</p> <p>Cocoa and chocolate in its many forms, bitter, sweet, milk, candy, etc., are increasingly used for food and drink. They are in some respects superior to both tea and coffee in supplying nutrient (oil, starch and albumen) in addition to the same stimulant principle.</p> <p>Cocoa butter is added to some of the finest candies and enters into the manufacture of cosmetics, pomades and soaps.</p> <p>Cocoa shells are of scarcely any importance.</p>	<p>Coffee is cultivated in many parts of the tropics. Brazil is by far the greatest producer, the coffee district being mainly in the states of São Paulo, Rio de Janeiro, Minas Geraes and Espírito Santo. Much coffee is grown in the mountains of northwestern South America, Central America and the West Indies. Coffee is grown in Java and other parts of the East Indies, as well as in smaller quantities in Arabia, Africa and Australia.</p>	<p>Two beans are usually contained in each red coffee berry. The berries are sometimes dried in the sun and then cleaned by machinery to separate the beans from the several coats which cover them. In the wet method the berries are first crushed and washed to free them from the pulp, after which the beans are dried in the sun and cleaned by machinery. The United States uses and people in some parts of the world prefer a much darker roast than others. Coffee is but little adulterated at the present time, but there are various substitutes on the market, such as malted barley, roasted malted barley, etc.</p> <p>The United States uses more coffee than any other part of the world both in total amount and per capita.</p>
<p><b>Cacao Beans</b> are the seeds of a rather small tree (<i>Theobroma cacao</i>). Fr., <i>Cacao</i>; Ger., <i>Cacao</i>; Sp., <i>Cacao</i>.</p> <p>(This species is absolutely distinct from the cocoanut palm and from coca, the leaves of which yield cocaine.)</p>	<p>Cocoa and chocolate in its many forms, bitter, sweet, milk, candy, etc., are increasingly used for food and drink. They are in some respects superior to both tea and coffee in supplying nutrient (oil, starch and albumen) in addition to the same stimulant principle.</p> <p>Cocoa butter is added to some of the finest candies and enters into the manufacture of cosmetics, pomades and soaps.</p> <p>Cocoa shells are of scarcely any importance.</p>	<p>Cacao trees are grown in warm moist climates, usually in the shade of larger trees. Brazil, Ecuador and the island of São Thomé in the gulf of Guinea, Venezuela, Trinidad, Mexico, Central America, Ceylon and the East Indies produce cacao. The beans grow in pods six to ten inches long, each of which contains, perhaps, fifty seeds. These, after removal from the rind, are dried, generally in the sun, on especially prepared floors. It is customary to allow them to ferment slightly before drying, to develop the flavor.</p>	<p>Chocolate is made by grinding cacao beans which have first been cleaned, roasted, crushed and separated from the thin skin or shell which covers each. Sugar, vanilla or other ingredients are added to make sweet chocolate, etc.</p> <p>Cocoa or cocoa powder is made by pressing the ground-up beans in a powerful machine to remove some of the oil, and then pulverizing the remainder. Because it contains less fat than chocolate some people find it easier of digestion.</p> <p>Cocoa butter is the solid oil or fat removed in making cocoa.</p>
<p><b>Yerba Mate</b> or (Paraguay tea), the dried leaves of a tree (<i>Ilex paraguayensis</i>). Fr., <i>Maté</i>; Ger., <i>Maté</i>; Sp., <i>Maté</i>.</p>	<p>These leaves contain caffeine and are used like tea.</p>	<p>The tree grows wild in Paraguay and adjoining regions of Argentina and Brazil. The leaves are not selected but entire branches are taken,</p>	<p>Great factories in the United States, Holland, France, Switzerland, England and Germany use the bulk of the crop of cacao beans. The United States imports beans from the producing countries and prepared chocolate and cocoa from Europe.</p>
<p><b>Mustard</b> is the seed of plants of the genera <i>Brassica</i> and <i>Sinapis</i>. Fr., <i>Moutarde</i>; Ger., <i>Senf</i>; Sp., <i>Mostazo</i>.</p>	<p>Yellow and black mustard are the important kinds, although some seeds are brown, red or white in color.</p> <p>Mustard is used in condiments and medicinally.</p> <p>Oil pressed from mustard seeds is used in some countries for burning and soap-making.</p>	<p>Widely cultivated in Europe, as well as in the United States, Asia and the East Indies.</p>	<p>After drying, the leaves and twigs are broken up and packed for sale. Maté is a common beverage in many parts of South America. Attempts, not very successful, have been made to popularize it in Europe and America.</p>
<p><b>Pepper</b> is the fruit of a vine (<i>Piper nigrum</i>). Fr., <i>Poivre</i>; Ger., <i>Pfeffer</i>; Sp., <i>Pimienta</i>.</p>	<p>Black pepper consists of the dry, unripe berries, while white pepper is the ripe fruits with the outer skin removed.</p>	<p>Grown chiefly in the neighborhood of Singapore and on the Malabar coast of India.</p>	<p>Used in larger amount than any other spice.</p> <p>Black mustard, or a mixture of black and yellow mustard, produces on mixing with water a very pungent essential oil. To this is due the sharp smell and taste of mustard and its action on the skin (in mustard plasters, etc.).</p> <p>The flour made by grinding the seeds of black and yellow mustard enters into a great many condiments.</p>
			<p>Whole peppers, i. e., the entire berries, are pulverized to make ground pepper. Much of the white and pink grades of pepper the United States consists of whole black and white pepper.</p>

## FOODSTUFFS—Continued

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Red Pepper</b> (Cayenne pepper or chillies) is the fruit of a small plant ( <i>Capiscum species</i> ). Fr., <i>Poudre de Cayenne</i> ; Ger., <i>Spanische Pfeffer</i> ; Sp., <i>Pimiento</i> .	Enters into the composition of many condiments, and unripe appears as green peppers. There are large and small varieties.	Grown in almost all parts of the world and used in large amounts by people in warm climates, in Mediterranean countries, India, Africa, Mexico and West Indies.	In addition to the local production, the United States imports red peppers from Africa and Japan.
<b>Allspice</b> (or Pimento) is the dried unripe fruit of a tree ( <i>Pimenta officinalis</i> ). Fr., <i>Piment</i> ; Ger., <i>Jamaikapfeffer</i> ; Sp., <i>Pimiento</i> .	A common spice, sometimes called <i>Jamaica pepper</i> .	Grown and produced almost exclusively in Jamaica.	The berries are simply dried in the sun and are commonly used whole. Popular because of its cheapness.
<b>Cloves</b> are the dried flower buds of a tree ( <i>Jambosa caryophyllus</i> ). Fr., <i>Girofle</i> ; Ger., <i>Gewürznelke</i> ; Sp., <i>Clavos de Girofla</i> .	A spice used in food, confectionery and liquors. <i>Clove oil</i> is employed also in medicine and dentistry and is the basis for the manufacture of artificial vanilla.	Cultivated in the Molucca Islands, East and West Indies, Zanzibar and Pemba.	The manufacture of vanilla, or artificial vanilla, from oil of cloves is important. The United States is the largest consumer of cloves.
<b>Nutmegs</b> are the kernels of the fruits of a small tree ( <i>Myristica fragrans</i> ). Fr., <i>Muscade</i> ; Ger., <i>Muskatnuss</i> ; Sp., <i>Moscada</i> .	The fruit looks like a small pear and the kernel is covered by a thin shell, outside of which is a red seed coat, which when dry is mace, another spice.	Nutmegs and mace are produced chiefly in Banda Islands, East Indies.	The selling price has fallen within recent years so that West Indian plantations are no longer profitable.
<b>Vanilla</b> is the prepared, unripe seed pod of an orchid ( <i>Vanilla planifolia</i> ). Fr., <i>Vanille</i> ; Ger., <i>Vanille</i> ; Sp., <i>Vainilla</i> .	The pods, or beans, are used in flavoring. <i>Vanilla extract</i> is made from the beans and is imitated with tonka beans (from a South American tree) and artificial vanilla (from coal tar or oil of cloves).	Vanilla beans are produced in greatest amount and best quality in the state of Vera Cruz, Mexico. Réunion, Tahiti and Mauritius supply inferior grades. The tree requires a very moist climate.	Aside from the use in food, candy, chocolate, ice cream, etc., the cheaper grades of vanilla are employed extensively in flavoring chewing tobacco.
<b>Ginger</b> is the dried root-stalk of a plant ( <i>Zingiber officinale</i> ). Fr., <i>Gingembre</i> ; Ger., <i>Ingwer</i> ; Sp., <i>Gengibre</i> .	<i>Coated ginger</i> is dried with the skin on, while <i>peeled ginger</i> is scraped and washed. <i>Crushed</i> and <i>preserved ginger</i> , powdered ginger and ginger ale are commonly sold.	Grown in tropical countries, particularly in Bengal, Cochín China, China, Africa and Jamaica. African is usually coated ginger and Jamaica is the best quality of peeled ginger.	Ginger is next to pepper among spices in the amount imported yearly into the United States, and ginger is also reported in large amount from Canton, China.
<b>Turmeric</b> consists of the dried stems of a plant of the ginger family ( <i>Curcuma longa</i> ). Fr., <i>Curcuma</i> ; Ger., <i>Galbännel</i> ; Sp., <i>Curcuma</i> .	Curry, a much used condiment, is compounded with turmeric powder.	Grown in southeastern Asia and neighboring islands.	Used industrially in making yellow dye for cotton goods, in preparing fancy leather and in chemical work.
<b>Cinnamon</b> is the dried bark from young twigs of a small tree ( <i>Cinnamomum zeylanicum</i> ). Fr., <i>Cannelle</i> ; Ger., <i>Zimmt</i> ; Sp., <i>Canela</i> .	The best is in quills, or long rods, composed of pieces of bark rolled together. Cheaper cinnamon or cassia is inferior. Used as a spice, usually in powdered form. Cinnamon oil is distilled from the bark as well as from leaves and twigs.	The best quality is from Ceylon. Cassia is from China, India and Indo-China.	Cassia is cheaper and much more common than true cinnamon.
<b>Caraway</b> , anise, sesame, cardamoms, coriander, and pistachio are less important spices.	<i>Sarsaparilla</i> , fruit juices, <i>aloes</i> , <i>sassafras</i> and many <i>essential oils</i> are used in flavoring.	Most spices are natives of Asia and the East Indies and are cultivated in the tropics and subtropics.	Many flavoring materials and extracts are made artificially in the chemical laboratory.
<b>Olives</b> are the fruit of a tree ( <i>Olea europea</i> ). Fr., <i>Olive</i> ; Ger., <i>Olive</i> ; Sp., <i>Olivo</i> .	Pickled olives are usually the unripe fruits prepared and bottled in salt water. <i>Olive oil</i> (sweet oil) is the most popular oil for table purposes. Oils from cotton seeds, peanuts, sesame seeds and other sources are used like olive oil.	The tree, which lives to a great age, grows in Mediterranean countries, California and Australia. Only limited districts produce olives fit for bottling. Most olives are grown for the production of oil.	Olives for pickling are soaked in lye to remove bitterness and often spices are added to the pickle to give an aromatic flavor. Olive oil is pressed from the ripe fruit. The poorer grades of oil are used in lubricating and for soap-making.

## NARCOTICS AND MEDICINES

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Tobacco</b> is the prepared leaf of a plant ( <i>Nicotiana tabacum</i> , <i>N. rustica</i> , etc.). Fr., <i>Tabac</i> ; Ger., <i>Tabak</i> ; Sp., <i>Tabaco</i> .	Commercial grades are named from the locality of production as Havana, Sumatra, Mexican, Turkish, Virginia, etc. Certain grades are appropriate for use as cigar wrappers and others for fillers and are so named in the trade. <i>Cigars</i> , <i>cigarettes</i> , <i>chewing tobacco</i> , <i>smoking tobacco</i> and <i>snuff</i> are extensively used. The stems and ribs of the leaves are employed in <i>sheep-dip</i> and for fumigating greenhouses.	More tobacco is raised in the United States than in any other country and Kentucky raises more than any other state. India is the second largest producer. In Europe it is cultivated in Austria-Hungary, Russia, Germany, Netherlands, France, Belgium and Turkey. Cuba, Porto Rico, Mexico, Central and South America, China, Java, Sumatra, Philippines, Ceylon, Syria and Cape Colony are important producers. Seeds of Havana tobacco plants raised in Connecticut or elsewhere produce a grade of Havana tobacco. The many grades of tobacco are due to the varieties of the plant, as well as to soil, climate and cultivation. The curing of the leaf is of the utmost importance. It includes a period of slight fermentation and drying in well ventilated barns.	Cigars are nearly all made by hand, but many cigarettes are manufactured by machinery. Nearly all plug tobacco is flavored with molasses, vanilla, licorice or other substances. The United States exports over half of the tobacco raised, chiefly to England in the form of leaf tobacco. Few cigars are exported, but cigarettes and plug tobacco go to the East Indies, China and Australia. Leaf tobacco is imported in large amount from Cuba, Sumatra, and Turkey and manufactured cigars are brought from Cuba. Large revenues are raised in many countries from the taxation of tobacco, and in Austria, France, Spain, Italy and Japan the tobacco business is a government monopoly.
<b>Hops</b> are the dried fruits of the hop vine ( <i>Humulus lupulus</i> ). Fr., <i>Houblon</i> ; Ger., <i>Hoffen</i> ; Sp., <i>Lupulo</i> , <i>hoblon</i> .	Hops are employed chiefly in brewing beer and malt liquors.	They are cultivated in almost all parts of Europe, especially in England, Germany and Austria. In the United States, California, Oregon, Washington, New York and Wisconsin produce the largest crops.	Hops are added to the malt, liquor, or wort, before fermentation and give a bitter flavor to malt liquors. Hops are not exported on a large enough scale to be an important item in commerce.

## NARCOTICS AND MEDICINES—Continued

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Opium</b> is the dried juice of the white poppy ( <i>Papaver somniferum</i> ). Fr., <i>Opium</i> ; Ger., <i>Opium</i> ; Sp., <i>Opio</i> .	Opium is valuable as a narcotic because of the morphine and other alkaloids it contains. <i>Laudanum</i> is a tincture of opium and alcohol. <i>Paregonic</i> is a common preparation in which opium is an ingredient.	Opium culture is an important industry in northern India, China, Persia, Asiatic Turkey and Egypt. In China the government strongly discourages opium smoking and has greatly restricted the cultivation of the poppy. The juice is obtained by severing the seed capsule and collecting the little drops which exude on it. The juice is then further dried in the sun.	Opium for smoking is exported to China from India. It is used in the form of pills in Mohammedan countries like Persia and Turkey. The United States imports opium for medicinal purposes chiefly from Turkey in Asia.
<b>Quinine</b> is the bark of a tree ( <i>Cinchona</i> sp.). Fr., <i>Quinquina</i> ; Ger., <i>Chinarinde</i> ; Sp., <i>Quina</i> .	A drug of great importance, much used in the form of sulphate of quinine or other salts.	Originally native in the Andes and hence called Peruvian bark. The world's supply now comes from plantations in Java, Produced also in South America, Ceylon and India.	The principal market is Batavia, Java, from whence it is largely shipped to Holland.
<b>Coca</b> is the leaf of a small tree or bush ( <i>Erythroxylon coca</i> ). Fr., <i>Coca</i> ; Ger., <i>Cocablatter</i> ; Sp., <i>Coca</i> .	Cocaine, an alkaloid which produces local anesthesia, is the important constituent.	Cultivated chiefly in steep valleys in the Andes of Peru and Bolivia, in smaller quantities in India, Ceylon and Java.	The Indians of the Andes chew the leaves on account of the stimulating effect, and the bulk of the crop is so used. The residuum is exported to manufacturers of medicinal preparations in Europe and America.
<b>Medicinal Plants</b> and drugs are numbered by the hundred. Among the most important are:	These are used in the form of extracts, tinctures and other pharmaceutical preparations.	Many grow wild, but the tendency of modern medicine is to use material from carefully selected plants cultivated for the purpose.	The preparation of medicines is carried on by a great number of firms in practically all parts of the world. The trade in drugs, however, is of less relative importance now than it was in the middle ages, when rhubarb, for example, occupied a prominent place in the list of commodities.
<b>Rhubarb</b> , a genus of plants belonging to the natural order <i>Polygonaceae</i> . Fr., <i>Rhubarbe</i> ; Ger., <i>Rhabarber</i> ; Sp., <i>Rubarbo</i> .	Its root has long been recognized as of medicinal value owing to its astringent properties. The principal finds of medicinal rhubarb have received such names as Russian or Turkey, East Indian, Himalayan, Chinese, and English, according to their source.	The best comes from China, though it is called Turkey rhubarb in Europe and America, generally there are several kinds of rhubarb cultivated for the sake of their stalks.	Rhubarb possesses more or less purgative and astringent properties; this is essentially the case with the roots, and hence these are largely used in medicine. The leaf-stalks of certain species are now largely used for tarts, puddings, jam, etc., and the juice is made into a kind of wine.
<b>Sarsaparilla</b> , the dried roots of several plants of the genus <i>Smilax</i> . Fr., <i>Salsepareille</i> ; Ger., <i>Sarsaparilla</i> ; Sp., <i>Sarsaparilla</i> .	<i>Smilax</i> medicis supplies the sarsa of Vera Cruz. <i>S. aspidiotis</i> , or <i>S. purpurea</i> , yields the Lisbon or Brazilian sarsa. <i>S. aspidiotis</i> belongs to the kind known as Jamaica sarsaparilla. <i>Desmodium illinoense</i> yields the East Indian sort.	There are two special varieties obtained from Jamaica and Lima respectively. The roots are very long, of the thickness of a quill, dark brown in color and bitter in taste.	Sarsaparilla is valued in medicine on account of its mucilaginous and demulcent qualities. Various decoctions made from the roots are medicinally used as tonics and diuretics, and derive their properties from the presence of starch, resin, a volatile oil, and the crystalline principle <i>smilagine</i> .
<b>Aconite</b> is a hardy herbaceous plant, natural order <i>Ranunculaceae</i> , represented by the well-known wolfsbane or monkshood. Fr., <i>Aconit</i> ; Ger., <i>Aconitwurz</i> ; Sp., <i>Aconito</i> .	An alkaloid contained in the leaves of monkshood. It is one of the most powerful poisons known.	The plants are natives of Europe, Asia, and North America, but the woody aconite, or monkshood, is probably a native of Great Britain.	They are remarkable for their poisonous properties and medicinal qualities, being used internally as well as externally in rheumatism, gout, neuralgia, etc. In certain forms, a tincture of the root is used medicinally in cases of heart disease.
<b>Ipecacuanha</b> , the dried root of several plants of the natural order <i>Rubiaceae</i> . Fr., <i>Ipecacuanha</i> ; Ger., <i>Ipecacuanha</i> ; Sp., <i>Ipecacuanha</i> .	The best is the annulated, yielded by the <i>Cephaelis ipecacuanha</i> .	It is a native of Brazil, and the dried root is exported from the Rio Janeiro, Buenos Ayres, and other South American ports. Recently the cultivation of the plant has been introduced into India and Ceylon. The name of <i>Americus ipecacuanha</i> is given to the <i>Euphorbia ipecacuanha</i> , a plant which grows in sandy places in North America.	It is simply the root that is valuable, and in its bark exists the active principle emetine, which renders ipecacuanha of service in medicine. The color of the root is generally brown or red. The cases in which ipecacuanha is used are mainly dysentery, asthma, and coughs.
<b>Belladonna</b> , a plant, <i>Atropa belladonna</i> , or deadly nightshade, natural order <i>Solanaceae</i> . Fr., <i>Belladone</i> ; Ger., <i>Belladonna</i> ; Sp., <i>Belladonna</i> . All parts of the plant are poisonous, and the insensating effect of the berries has often produced death.	The insipidated juice is commonly known by the name of extract of belladonna.	A plant which has narcotic and poisonous berries, a native of Europe.	The extract of the plant is used medicinally for soothing irritation and pain, and by oculists for the purpose of dilating the pupil during an examination of the eye, and diminishing the sensibility of the retina to light. The activity of belladonna is owing to the presence of the alkaloid atropine.
<b>Nux Vomica</b> , the fruit of a species of <i>Strichnos</i> , order <i>Loganiaceae</i> . Fr., <i>Nux vomique</i> ; Ger., <i>Brechnuss</i> ; Sp., <i>Nuez vomica</i> .	The taste of the berries is exceedingly bitter, and from them the two alkaloids strychnine and brucine are obtained.	The plant is chiefly found in Cochinchina and the East Indies. The fruit of the tree is a large berry, much like a small orange, and in it the seeds are laid flat.	The seeds are mainly exported from India, and their only value is for the extraction of the alkaloids, which are used in medicine. The alkaloids are known as a very virulent poison.
<b>Castor</b> , the name of the plant <i>Ricinus communis</i> , and also of the oil extracted from the seeds of the plant. Fr., <i>Huile de ricin</i> ; Ger., <i>Rizinöl</i> ; Sp., <i>Acetie de ricino</i> .	The beans and the oil made therefrom.	It is a native of India, but its cultivation is now very widespread. The seeds are oval in shape, and mottled brown in color.	The oil is obtained from the seeds by bruising and pressing. It is afterward heated to the boiling point, which coagulates and separates the albumen and impurities. Castor-oil is used medicinally as a mild but efficient purgative. It is chiefly imported from India.
<b>Areca</b> , a genus of lofty palms with pinnated leaves, and a drupe-like fruit enclosed in a fibrous rind. Fr., <i>Arec</i> ; Ger., <i>Arec</i> ; Sp., <i>Arec</i> .	It produces nuts and fibers.	The tree grows in various parts of the East Indies, and is cultivated on account of its nuts. There are two species of areca and each of them is remarkable for the purposes to which its fruit is applied. One is the <i>Arec catechu</i> , also known as the betel-nut palm, which is one of the most beautiful trees of the East Indies.	With lime and the leaves of the betel pepper, the areca-nuts when green form the celebrated masticatory of the East. They are an important article in eastern trade. The nuts are also imported into Europe and America for the manufacture of tooth powder.

## NARCOTICS AND MEDICINES—Continued

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Aloe</b> , a plant of which there are nearly two hundred species. Fr., <i>Aloë</i> ; Ger., <i>Aloe</i> ; Sp., <i>Aloe</i> .	From the juice of the leaves of many species a drug is obtained, known as aloe, which is of much value in medicine. <i>Aloe ferox</i> is obtained from species of <i>aloe</i> , <i>agave</i> , <i>yucca</i> , etc., and is made into coarse fibres, ropes, etc.	The principal drug-producing species are the Socotrine aloe, the Barbados aloe, the Cape aloe, etc. A beautiful violet color is afforded by the leaves of the Socotrine aloe. The American aloe is a different plant altogether, as are also the aloes or lign-aloes of scripture, which are supposed to be the <i>Aquilaria</i> <i>agallocha</i> or aloë wood.	Some of the larger kinds are of great use, the fibrous parts of the leaves being made into cordage, fishing nets and lines, cloth, etc. The inspissated juice of several species is used in medicine, under the name of aloe, forming a bitter purgative. Formerly the chief source of the drug was Socotry, but it is now imported from various parts of the world.
<b>Kola</b> , the seeds or fruit of the <i>Sterculia acuminata</i> . The nuts are also known as gura nuts. Fr., <i>Noix de kola</i> ; Ger., <i>Kolanüsse</i> ; Sp., <i>Nueces de kola</i> .	Nuts and alkaloids.	The tree grows extensively in tropical Africa.	Medicinally the nuts are employed in case of diarrhoea and affections of the liver. Large supplies are shipped from the Gambia to France and Germany, where they are used to adulterate cocoa and chocolate.
<b>Angostura Bark</b> , the aromatic bitter medicinal bark obtained chiefly from <i>Galipea officinalis</i> . Also called euparia bark. Fr., <i>Ecorce d'Angostura de Columbie</i> ; Ger., <i>Angosturabinde</i> ; Sp., <i>Cortés de Angostura</i> .	Chiefly valuable for its bark.	The tree is 10 to 20 feet high, and grows in the tropical regions of South America.	The bark is valuable as a tonic and febrifuge and is also used for a kind of bitters. From this bark being adulterated by the poisonous bark of <i>Strychnos</i> <i>Nux Vomica</i> , its use as a medicine has been almost given up. It is an article of considerable commerce in Venezuela.

## FIBERS

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Manila Hemp</b> is a fiber obtained from the leaf stalk of a tree ( <i>Musa textilis</i> ) of the banana family. Fr., <i>Chanvre de Manille</i> , <i>Abacé</i> ; Ger., <i>Manilla hanf</i> ; Sp., <i>Abacé</i> .	The strongest rope fiber in common use, especially desirable for marine cordage. The finest fibers are used by natives in the Philippines for weaving a strong cloth.	Produced commercially only in the Philippine islands. Practically all of this fiber is cleaned by hand.	The most important export from the Philippines. The bulk of the production is sent to the United States and England.
<b>Sisal</b> (henequen or sisal hemp) is a hard, strong fiber from the leaves of a century plant ( <i>Agave rigida</i> ). Fr., <i>Sisal</i> , <i>Chanera d'Amérique</i> ; Ger., <i>Stad hanf</i> ; Sp., <i>Henequen</i> , <i>Maquay</i> . Many similar fibers are obtained from the leaves of other species of <i>agave</i> plants.	Sisal is very important for making rope and twine. All of these fibers are used locally for making mats, bags, ropes, harness, hammocks, etc., and several of them are employed in the United States and Europe for making sackings and brushes. <i>Mescal</i> and <i>pulque</i> are alcoholic drinks made in Mexico from the sap of <i>agave</i> plants.	Sisal is cultivated in Yucatan and the Bahamas. Plantations of henequen, or <i>maquay</i> , have been established in Cuba, Hawaii, India, German and British East Africa and the Philippines. The home of the <i>agave</i> plants in Mexico and Central America and this part of the world produces most of these fibers.	On modern plantations machines have superseded the primitive hand methods of cleaning the fiber. Sisal is the chief product of Yucatan and its greatest export. The bulk of the production is used in the United States in making rope, twine and sackings. All of the other <i>agave</i> fibers are of less commercial importance than sisal or henequen.
<b>New Zealand Flax</b> (or New Zealand hemp) is a fiber from the leaves of a plant ( <i>Phormium tenax</i> ) of the lily family. Fr., <i>Chanvre de la Nouvelle Zélande</i> ; Ger., <i>Neuseelandhanf</i> ; Sp., <i>Cañamo de la Nueva Zelanda</i> . Fibers more or less similar to the foregoing are obtained from the leaves of other plants.	Used in rope making.	A wild plant in New Zealand. Prepared by scraping away the pulpy part of the leaf.	An important cordage fiber. The fiber exported is all graded by New Zealand government inspectors, who certify to its quality.
<b>Flax</b> is the bast fiber of an annual herb ( <i>Linum catharticum</i> ). Fr., <i>Lin</i> ; Ger., <i>Flachs</i> , <i>Lein</i> ; Sp., <i>Lino</i> .	Flax or linen fiber and flaxseed oil are the chief products of the plant. <i>Tow</i> is a by-product in making linen and flax yarns and fabrics. <i>Lanseed oil</i> is used in paints, varnishes, printer's ink, oleic acid and linoleum. <i>Lanseed oil-cake</i> is a valuable cattle food. <i>Flax seeds</i> find limited use in medicine.	The plants grow wild in the warmer parts of both the old and the new worlds. Some are cultivated, but on a smaller scale than with sisal.	While these fibers are used to some extent in the mills of Europe and America, they are of relatively small importance.
		Flax is grown for fiber in Russia, Belgium, Italy, France, Holland, Ireland and Egypt. Little flax fiber is produced in the United States. Plants for fiber production are straight stemmed, while the varieties grown for seed have many branches. Flax seeds are produced in Russia, India, Argentina and the United States. Plants harvested for fiber are pulled up by the root in order to obtain the greatest possible length. The fiber is separated from the stalk of the plant by retting, a process of partial decay, breaking and scutching to remove the woody parts and hackling or combing. In the best grades of flax most of this work is done by hand.	Flax yarns are used in making rope, twine, lagging and coarse unbleached fabrics. Linen yarns are made into products of the better grade, including fine linens, cambrics, laces, etc. Linen is bleached by exposure to the sun and by treatment with a dilute solution of chloride of lime. Linen rags are the stock for the best qualities of paper. The United States imports flax fiber mainly from Europe, as well as large quantities of linens, laces, etc. Some flax seeds are imported and large amounts of flaxseed oil-cake are sent to Europe.

## FIBERS—Continued

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<p><b>Hemp</b> is the bast fiber from a tall plant (<i>Cannabis sativa</i>) of the nettle family. Fr., <i>Chanvre</i>; Ger., <i>Hanf</i>; Sp., <i>Canamo</i>.</p> <p>Other hemp's of different botanical origin and having quite different qualities are called by such names as manila hemp, sisal hemp, tampico hemp, Mauritius hemp, sunn hemp, bowstring hemp, etc. Strictly speaking, none of these is true hemp.</p> <p><b>Jute</b> is the bast from a tall plant (<i>Corchorus</i> sp.). Fr., <i>Jute</i>, <i>Chanvre de l'Inde</i>; Ger., <i>Jute</i>, <i>Jutehanf</i>; Sp., <i>Cañamo de las Indias</i>.</p>	<p>As with other cordage fibers of this character, the long, combed fibers are called line and the short strands, tow. The commercial fiber is longer, coarser and less strong than flax. It cannot be bleached perfectly white, although used in so-called white line. Russian, Italian and Kentucky, as applied to hemp, denote the country of origin. Italian hemp is the finest, Kentucky the strongest.</p> <p>Hemp oil is pressed from the seeds. The dried leaves (<i>slang</i>) are smoked or made into a drink in India and used, as is an extract (<i>hachek</i>), as an intoxicant.</p> <p>The commercial fibers are long, but softer and weaker than hemp. It does not bleach well and is less durable than hemp, especially when exposed to dampness. Extensively employed in cordage, burlap, bagging, carpets, etc.</p> <p>Jute burl, or rjections, are so important paper stock.</p>	<p>Cultivated in Russia, the warm countries of Asia, the shores of the Mediterranean, Kentucky, Missouri, Illinois and California. The fiber is extracted by retting, cleaning and combing, but more of the work is done by machinery than in the case of flax.</p> <p>Grown in large quantities in the Ganges valley, India, and in lesser amount through other parts of southeastern Asia.</p> <p>The stalks are retted and treated like flax and hemp.</p>	<p>Russia produces more hemp fiber than all the rest of the world. Russia and Italy are the largest exporters. The United Kingdom uses a very large amount of the fiber in making binder twine and bagging. Hemp is considerably used in carpet manufacture.</p> <p>The use of jute for making bagging and burlap has had the effect of lessening the demand for hemp.</p> <p>Hemp oil is used in paints, varnishes and soap. The oil-cake is a cattle food.</p> <p>Jute does not easily spin into fine threads. Its chief use is in making burlap and gunny sacks, although it is used in twine, rope, carpets, curtains, upholstery fabrics such as plushes, etc.</p> <p>Calcutta is the great shipping port for jute fiber and Dundee, Scotland, the most important place for its manufacture. There are large jute mills making burlap, etc., in India, the United States and other countries. Paper is made in this country use a large amount of jute burl for making wrapping papers.</p> <p>Used largely in China for weaving grass cloth, or Canton linen. The fiber is very difficult to dye. Many experiments are being made to find a satisfactory process. Now used in making fabrics of high quality for use in underwear, plushes, etc. Will be used more largely as its manufacture is improved.</p> <p>These fibers are not used on a large scale. Cuba bast is known to India and used for tying bundles of cigars.</p>
<p><b>Ramie</b> is the bast fiber from a plant (<i>Boehmeria nivea</i>) of the nettle family. Fr., Ger. and Sp., <i>Ramie</i>.</p>	<p>Commonly called China grass, or rhea, although fibers from other plants sometimes receive these names. Usually strong and silky in appearance, but difficult to clean and bleach.</p>	<p>Cultivated chiefly in China. Produced in Indo-China, India and on a small scale in Mediterranean countries. Will probably be cultivated widely when cheap processes can be employed for the preparation of clean fiber.</p>	<p>Used largely in China for weaving grass cloth, or Canton linen. The fiber is very difficult to dye. Many experiments are being made to find a satisfactory process. Now used in making fabrics of high quality for use in underwear, plushes, etc. Will be used more largely as its manufacture is improved.</p>
<p><b>Bast Fibers</b> from other plants are of some importance; among these are sunn hemp, India bast, Cuba bast and lace bark.</p>	<p>Sunn hemp is similar to jute in its qualities and uses. Linseed bast or Russian bast is made into mats, ropes, etc.</p>		
<p><b>Cocoanut Palm.</b>—This tree (<i>Cocos nucifera</i>) yields a great variety of useful products. Fr., <i>Cocotier</i>; Ger., <i>Cocospalme</i>; Sp., <i>Coco</i>.</p>	<p><i>Cocoanut fiber</i> (coir, or cocoa fiber) is obtained from the outer husk of the seed. The shells are made into cups. The milk is a nourishing drink. The kernel or meat of the nut is used for food as shredded or desiccated cocoanut. Dried cocoanut meat (<i>copra</i>) is pressed to make cocoanut oil for soap and candles making and cooking. The oil-cake is a valuable cattle food. Cocoanut wood (<i>porcupine</i>) from the trunk of the tree is out of great importance.</p> <p><i>Palm sugar</i> is made from the juice collected from the flower spathe or the juice is fermented to make alcoholic drinks (<i>toddy</i>, <i>tuba</i>, <i>arrack</i>).</p>	<p>The cocoanut (or coco-nut) palm grows in coast regions throughout the tropics. It is commonly cultivated, but frequently its products are of only local use. Plantations in nearly all parts of the world supply some articles for export.</p>	<p>Cocoanut fiber is made into matting, ropes and brushes, and the poorer grades are used in upholstery. Coir fiber comes chiefly from Ceylon and India. Much is imported into the United States in the form of yarn.</p> <p>Cocoanut oil and copra are among the chief exports of Ceylon. Copra is obtained also from islands in the Pacific and Indian oceans and in smaller quantities from other parts of the tropics. Cocoanut oil is manufactured and used on a larger scale in Europe than in the United States. Fresh cocoanuts come to this country largely from the West Indies and northern South America.</p>
<p><b>Cotton</b> consists of the seed hairs of a plant (<i>Gossypium</i> sp.). Fr., <i>Coton</i>; Ger., <i>Baumwolle</i>; Sp., <i>Algodon</i>.</p>	<p>The chief commercial types of cotton are American upland, sea island, Egyptian, Indian, Brazilian and Australian. They differ in the length of the individual fibers (staple). The quality is indicated by the grading under such names as fine, good, good fair, fully fair, middling fair, good middling, middling, etc.</p> <p>Cotton fiber is spun into yarn and made into thread, muslin, calico and hundreds of other cotton or part cotton fabrics. Mercerized yarn is prepared by treatment with strong caustic alkali. Cotton fibers are used in cheap yarns, cotton batting, mattresses, and the manufacture of celluloid and artificial silk. Cottonseed oil is used for table purposes, for packing sardines, for cooking, making soap, candles, etc.</p>	<p>Cotton is next to corn the most valuable farm crop of the United States. Nearly three-fourths of all the cotton produced annually in the world is grown in the south Atlantic and gulf states. The remainder comes mostly from India, Egypt, China, Brazil, and Asiatic Russia. A comparatively small percentage of the crop is sea island cotton from the coast of Georgia and from islands in the West Indies. The area of cotton production is spreading in the United States as well as in foreign countries.</p> <p>The cotton fiber, attached to the seeds, is picked by hand from the plants in the field. The seeds and fiber (or lint) are separated by machines (cotton gins) and the cotton is pressed into bales. Cotton seeds are subjected to heavy pressure in machines in order to extract the oil. The oil-cake is a valuable cattle food and the hulls are used for fuel or for paper making.</p>	<p>The greatest centers of cotton manufacture are in England, New England, the Carolinas and Georgia. Germany, Russia, India and Japan are among the important manufacturing nations.</p> <p>Modern cotton mills are of immense size. The bales are opened, the cotton cleaned, carded, and twisted into slivers, rovings, and finally into yarn. Raw cotton, cotton yarn and cotton fabrics are all important to trade. About half the crop of the United States is exported in bales to be manufactured in the mills of other countries. Sea island cotton has no longer staple and is used for the finest qualities of yarn and fabrics. Egyptian cotton also has a long staple. Large quantities are imported into the United States.</p> <p>England has an enormous foreign trade in cotton fabrics. The United States exports chiefly unbleached muslin, more of which goes to China than to any other country.</p> <p>These fibers can not be spun satisfactorily in the United States, only for upholstery. The chief European market is in Holland.</p>
<p><b>Silk Cotton</b> consists of the seed hairs of various trees and plants. Kapok is from a large tree (<i>Cordia alliodora</i>). Fr., <i>Kapok</i>, <i>Sole vegetable</i>; Ger., <i>Kapok</i>, <i>Wolle der Weltbaum</i>; Sp., <i>Kapok</i>, <i>Algodon de seda</i>.</p>	<p>Kapok or <i>ceiba</i> is the commonest vegetable silk in commercial use. Similar fibers from other sources are called <i>balsa</i>, <i>poche</i> and other names.</p>	<p>Kapok comes chiefly from Java, although the tree is common in many parts of the tropics. The drop is principally from wild trees.</p>	<p>These fibers can not be spun satisfactorily in the United States, only for upholstery. The chief European market is in Holland.</p>

## FIBERS—Continued

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Raphia</b> is peeled from the large leaflets of a palm tree ( <i>Raphia pedunculata</i> ). Fr., <i>Raffia</i> ; Ger., <i>Raphia-faser</i> ; Sp., <i>Raphia</i> .	Madagascar raphia is the only important grade. A similar soft fiber used locally is produced in West Africa.	From a very common wild tree.	Exported in considerable amounts from Madagascar and used by gardeners for tying plants. Used for making mats and baskets and in kindergartens.
<b>Piassava</b> comes from the sheathing bracts of certain palm trees, in West Africa <i>Raphia vinifera</i> ; in Bahia, Brazil, <i>Attalea funifera</i> ; in Para, Brazil, <i>Leopoldinia piassava</i> . Fr., Ger. and Sp., <i>Piassava</i> .	Stiff coarse fibers known as West African bass, Bahia or Para bass or piassava.	From wild trees.	Used in making brooms and brushes. Piassava is an important export from the producing regions.
<b>Kitfool</b> ( <i>Corypha urens</i> ) and <b>Palmyra</b> fiber or <b>bassine</b> ( <i>Borassus flabellifer</i> ) are from the leaf sheaths of other palms.	These and several other palm fibers of lesser importance are finer and less stiff than piassava.	Produced in Ceylon and India.	Fairly important for brush making, having some resemblance to bristles.
<b>Palmetto</b> fiber is from the leaf stalks and creeping stems of a palm ( <i>Serenoa serrulata</i> ).	The fiber and an extract used in tanning are both obtained from this palm.	Grows in Georgia, Florida, Alabama and Mississippi.	Manufactured in limited amount. Used for upholstery and in paper making.
<b>Crin Vegetal</b> is the shredded leaves of a palm ( <i>Chamaerops humilis</i> ). <b>Panama Straw</b> ( <i>Carludovica palmata</i> ) and many other fibers are of commercial value.	Crin vegetal and Spanish moss are used in upholstery, needles in brush making, exports for paper stock, and Panama straw for weaving hats.	Crin vegetal grows wild in Algeria. Spanish moss is prepared for use in the Southern states. Exporto comes from North Africa. Zaccatoa roots from Mexico. The best Panama straw is prepared in Ecuador and Peru.	These fibers are fairly important to trade. Panama straw enters into commerce only as Panama hats and is not an article of export in its crude state.
<b>Rattan</b> is the stem of a climbing palm ( <i>Calamus</i> species). Fr., <i>Ratin</i> ; Ger., <i>Indianische Rohr</i> , <i>Rotang</i> ; Sp., <i>Roten</i> , <i>Bejuco</i> .	Rattan cane is used whole or peeled. Split rattan is the bark which is removed from the peeled rattan.	Rattan vines grow wild in tropical forests of southeastern Asia. The thorny leaves and branches are cleaned away from the stems and the outer skin is removed. Then the rattan is cut into lengths, sorted according to thickness and tied in bundles.	Used for a multitude of purposes in the east. In Europe and America for making furniture, baskets, whips, etc. Split rattan is used for chair seats and peeled rattan for brushes and baskets. Exported largely from Singapore and Java.
<b>Bamboo</b> is the stem of the largest plant of the grass family ( <i>Bambusa</i> species). Fr., <i>Bamboo</i> ; Ger., <i>Bambusrohr</i> ; Sp., <i>Bamboo</i> , <i>Bambu</i> , <i>Caña</i> .	One of the most useful plants in the world. Whole stems and split bamboo are both important commercially.	Grows in tropical countries. Most common in southern Asia and the East Indies.	In the east, large bamboo serves for house construction, furniture, utensils, agricultural implements, fishing rods, and hundreds of other purposes. The young shoots are eaten as a fresh vegetable. Split bamboo is woven in baskets, mats, etc., and used in stiff brushes. Imported from the East Indies.

COMMERCIAL WOODS  
SOFT WOODS OR NEEDLE-LEAVED WOODS

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Fine Wood</b> is from various species of coniferous trees ( <i>Pinus strobus</i> , <i>P. palustris</i> , etc.). Fr., <i>Pin</i> ; Ger., <i>Fichte</i> , <i>Tanne</i> ; Sp., <i>Pino</i> .	Soft pines are of several kinds, chiefly white pine, western white pine, sugar pine and red pine. Hard or yellow pines are more numerous and include longleaf, <i>Georgia</i> , hard or southern pine, shortleaf (bald spruce), Cullen, slash, pitch or loblolly pine, western yellow pine and European (northern) pine, called also yellow deal and Scotch fir. Turpentine (spirit of turpentine) and resin (copal) are prepared from the sap of certain species of yellow pine trees. Tar, pitch, charcoal and other products are obtained by distilling yellow pine wood.	Soft pine forests yield lumber in the northern United States and Canada and in the Rocky mountains. White pine was formerly the common timber in the Appalachians, but the supply is almost exhausted. Yellow pine is cut in large amount in the forests from North Carolina to Texas, and other hard pines come from the middle and far west, as well as from Mexico and the West Indies. Scotch fir is one of the most important woods of northern Europe. Turpentine is distilled from the sap of pines in Georgia and adjacent states, Russia, Austria, France and India.	The industries relying mainly on the forest and its products in the United States employ almost a million workers and add perhaps two billion dollars annually to the wealth of the nation. Pine is the most important construction wood in use. Very little of the great area formerly covered with white pine now remains in this country. The yellow pine is being cut rapidly and the price of lumber has practically doubled in the past twenty years.
<b>Spruce</b> ( <i>Picea</i> species). Fr., <i>Sapin</i> , <i>Épinette</i> ; Ger., <i>Fichte</i> ; Sp., <i>Abeto</i> , <i>Picea</i> . <b>Hemlock</b> ( <i>Tsuga</i> species). Fr., <i>Ciguë</i> ; Ger., <i>Schierling</i> ; Sp., <i>Pinabete</i> . <b>Fir</b> ( <i>Abies</i> or <i>Pseudotsuga</i> species). Fr., <i>Sapin</i> ; Ger., <i>Tanne</i> ; Sp., <i>Abeto</i> , are coniferous soft woods of great importance.	These are known by many names and there are several botanical species of each. Black, white, red, tidesland and Norway spruces, Douglas fir and European silver fir ( <i>Sorbus picea</i> ) are most important.	The spruces are common in Canada, northern Europe and on the northern Pacific coast of America and Asia. Hemlock is cut in northern United States, Canada, Japan and Siberia. Fir is found in the same general region as spruce.	The United States exports soft woods, chiefly pine, spruce and hemlock, to Europe, the West Indies, South America, Australia, Hawaii and Africa. Canada exports large quantities of spruce and pine to the United States and England. Russia and Sweden supply great quantities of soft woods to Europe, although the forests of Sweden are being rapidly cut away.
<b>California Redwood</b> comes from a coniferous tree ( <i>Sequoia sempervirens</i> ).	A soft, straight-grained, durable wood. Much used in shingles.	One of the largest trees of the world. Found only on the Pacific coast.	Northern Japan and eastern Siberia contain forest areas rich in soft woods, which are beginning to be developed.
<b>Cedar</b> . Fr., <i>Cedre</i> ; Ger., <i>Zeder</i> ; Sp., <i>Cedro</i> , and <i>Cypresse</i> . Fr., <i>Cypresse</i> ; Sp., <i>Ciprés</i> , are of many species ( <i>Thuja</i> , <i>Chamaecyparis</i> , <i>Juniperus</i> , <i>Taxodium</i> , etc.).	Bald cypress, yellow cypress, Indian cypress, white cedar, juniper, red cedar and dozens of other woods have more or less similarity.	These woods are widely distributed and extensively used, but are not marketed in such large amounts as the pines, spruces and firs.	

**COMMERCIAL WOODS—Continued**  
**HARD WOODS OR BROAD LEAVED WOODS**

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Poplar, Tulp Poplar</b> ( <i>Liriodendron tulipifera</i> ) and <b>Carolina Poplar</b> ( <i>Populus deltoides</i> ) are both large trees. Fr., <i>Peuplier</i> ; Ger., <i>Pappelholz</i> ; Sp., <i>Alamo</i> .	Tulip poplar (white-wood) and Carolina poplar ( <i>luticeum</i> ), although classed in the trade as hard woods, are almost as soft as pine.	Both are from large trees in the eastern and central United States.	Poplars and lindes are soft, light, comparatively cheap woods, extensively used for general construction. They are not especially strong. All of them are important in paper making.
<b>Linden</b> comes from the basswood or lime tree ( <i>Tilia</i> species). Fr., <i>Tilleul</i> ; Ger., <i>Linde</i> ; Sp., <i>Tila</i> , <i>Tilo</i> .	Linden, basswood and white-wood are the names used in America. Linden, lime or lin are European names. The bark supplies a useful bast fiber for ropes, mats, etc.	Common in southern Canada, central United States and Europe, growing to be trees of fairly large size.	
<b>Maple</b> ( <i>Acer</i> species).—Fr., <i>Erable</i> ; Ger., <i>Ahorn</i> ; Sp., <i>Arce</i> , <i>Meple</i> . <b>Birch</b> ( <i>Betula</i> species).—Fr., <i>Bouleau</i> ; Ger., <i>Birke</i> ; Sp., <i>Abedul</i> . <b>Beech</b> ( <i>Fagus</i> species).—Fr., <i>Hêtre</i> ; Ger., <i>Buche</i> ; Sp., <i>Haya</i> . <b>Sycamore</b> ( <i>Platanus</i> species).—Fr., <i>Sycamore</i> ; Ger., <i>Platan</i> ; Sp., <i>Platano</i> . These four are among the important hard woods in common use.	<i>Sugar maple</i> , <i>silver maple</i> , <i>rock maple</i> , <i>black birch</i> , <i>cherry birch</i> , and many other names are employed. Peculiarities of the grain are known as bird's-eye, curly, etc., in the trade.	All of these are obtained from the hardwood forests of central United States and Europe. In some European forests the trees have been carefully planted and scientifically tended.	These are close-grained hard woods, suitable for furniture and cabinet work. Birch is the wood commonly used in imitation of mahogany. The silver maple and the Japan maple are highly valued as shade and ornamental trees.
<b>Oak</b> is from many species ( <i>Quercus alba</i> , <i>Q. rubra</i> , <i>Q. robur</i> , etc.). Fr., <i>Chêne</i> ; Ger., <i>Eiche</i> ; Sp., <i>Roble</i> , <i>Encino</i> .	White oak, chestnut oak, live oak, red oak, black oak, gum oak, willow oak, and many other varieties are found in the lumber trade. Oak bark is used in tanning leather. Oak is the bark of one species ( <i>Q. suber</i> ) found in Portugal, Algeria and Spain.	Chiefly from eastern and central United States and Europe. Oaks are found also in many other parts of the world.	An open-grained hard wood of great strength and durability. When cut parallel to the medullary rays (quartered oak) it exhibits a beautiful grain valued highly for cabinet work.
<b>Chestnut</b> ( <i>Castanea</i> species) is a large tree. Fr., <i>Châtaigne</i> ; Ger., <i>Kastanien</i> ; Sp., <i>Castaña</i> .	American and European chestnut woods are very similar. The nuts are popular for food. An extract from wood and bark is used in tanning.	Formerly a very common tree in the northern United States and still abundant. Common also in Europe.	The wood is used extensively for cabinet work. It is open-grained, softer and much less strong than oak.
<b>Ash</b> ( <i>Fraxinus</i> species).—Fr., <i>Frêne</i> ; Ger., <i>Esche</i> ; Sp., <i>Fresno</i> . <b>Elm</b> ( <i>Ulmus</i> species).—Fr., <i>Orme</i> ; Ger., <i>Ulm</i> ; Sp., <i>Ulm</i> . <b>Hickory</b> ( <i>Hicoria</i> species).—Fr., <i>Noyer</i> ; Ger., <i>Hickory</i> ; Sp., <i>Nogal americano</i> .	These woods are of much commercial value. Hickory nuts are marketed.	The trees are found in the central United States, some on the west coast. Ash and elm grow also in Europe and Asia.	Valuable for their toughness and elasticity. Used for tool handles, carriage and wagon building, furniture, etc.
<b>Walnut</b> ( <i>Juglans</i> species).—Fr., <i>Bois de noyer</i> ; Ger., <i>Nussholz</i> ; Sp., <i>Nogal</i> .	American black walnut, English, Italian, French and Moroccan walnut are commercial varieties. The nuts are exported from southern Europe.	Formerly a very abundant tree in the central United States. Has now become scarce, and high priced. Grown in many parts of Europe.	Used for gun stocks, cabinet work, veneering, etc. A highly decorative wood which has gone out of style in the United States because it is difficult to obtain.
<b>Cherry</b> is from the wild black cherry tree ( <i>Prunus serotina</i> ).		Native in the eastern United States.	Valued on account of its red color. The walnut, cherry has become scarce and high priced.
<b>Sweet Gum</b> is from a common tree ( <i>Liquidambar styraciflua</i> ).	The wood is called gum, red gum, bassal or bilated.	Native in the United States and Mexico. Cut chiefly in the Southern states.	A cheap cabinet wood, used to some extent in building.

**IMPORTED CABINET WOODS**

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Mahogany</b> is the wood of a tropical tree ( <i>Swietenia mahoganii</i> or <i>Khaya</i> species). Fr., <i>Acajou</i> ; Ger., <i>Mahagoniholz</i> ; Sp., <i>Caoba</i> .	<i>Santa Domingo</i> , Cuban and other kinds are named from the locality of production. Honduras big wood is of inferior quality. Nearly all of the wood with a beautiful grain, or figure, is cut into thin veneers.	A wild tree in tropical forests of the West Indies, Mexico, Central and South America. African mahogany ( <i>Khaya</i> ) comes from the west coast.	One of the most sought for of all cabinet woods. Largely imported into Europe and America. Particularly useful because of its beautiful color, grain and durability.
<b>Cigar-Box Cedar</b> is from a tree of the mahogany family ( <i>Cedrela odorata</i> ).	<i>Cedre</i> is the name under which this wood is largely handled.	Produced largely in West Indies, Mexico, Central America and northern South America. True mahogany of Australia is very similar.	One of the important woods of commerce. Too soft for the best grade but considerably used for furniture.
<b>Teak</b> is from a large tree ( <i>Tectona grandis</i> ). Fr., <i>Teck</i> ; Ger., <i>Teakholz</i> ; Sp., <i>Teca</i> .	Especially valuable for shipbuilding because it is practically indestructible.	Chiefly from Burma. Grows in southeastern Asia and adjacent islands.	A very important export from farther India.
<b>Ebony</b> ( <i>Diospyros</i> species).—Fr., <i>Ebène</i> ; Ger., <i>Ebenholz</i> ; Sp., <i>Ebano</i> ; and <b>Rosewood</b> ( <i>Dalbergia</i> or <i>Machroux</i> sp.).—Fr., <i>Bois de rose</i> ; Ger., <i>Rosenholz</i> ; Sp., <i>Falso rosa</i> . are important fancy woods.	<i>Cocobolo</i> , <i>tulip</i> , <i>amaranth</i> , <i>padouk</i> , <i>santwood</i> , and many others are used for cabinet work and fancy articles.	Nearly all of these hard woods of beautiful colors are from tropical forests.	<i>Lignum vitae</i> is especially useful for making pulleys and castor wheels. These woods are obtained in only limited quantity and many of them are sold by weight rather than measure.



GUMS, RESINS AND EXTRACTS

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Gum Arable</b> is from small thorny trees ( <i>Acacia</i> species). Fr., <i>Gomme arabique</i> ; Ger., <i>Arabisches gumm</i> ; Sp., <i>Goma arabe</i> . <b>Gum Tragacanth and Mesquite Gum</b> are similar.	<i>Kordofan gum</i> , <i>Senechal gum</i> , <i>Babary gum</i> , <i>Copa gum</i> and <i>Wadai gum</i> are all of similar nature.	The trees grow wild in sandy regions in Africa and Australia.	These gums are soluble in water. Used for making moustique, confectionery, etc., and in stiffening and printing silk and cotton fabrics.
<b>Copal</b> is resin produced by trees of many species. Fr., and Ger. <i>Copal</i> ; Sp., <i>Goma copal</i> . ( <i>Trachylobium</i> , <i>Dammara</i> , <i>Hymenaea</i> , <i>Agathis</i> , etc.).	Copals are named usually from their locality as <i>Zanzibar</i> (the hardest), <i>Sandaran</i> , <i>Mosambique</i> , <i>Torre Leone</i> , <i>Brasilia</i> , <i>Angola</i> , <i>Lodaga</i> , <i>South American</i> , <i>Manila</i> , etc. <i>Kauri</i> is from the <i>kauri</i> pine tree of New Zealand.	These resins are mostly gathered from the trunks and branches of living trees. The best and hardest varieties, like <i>Zanzibar</i> and <i>kauri</i> , are found underground, having been formed perhaps ages ago and become partly fossilized.	Used for making varnishes by dissolving them in spirits of turpentine and oil. The most expensive are commercially important.
<b>Dammar</b> , <b>Sandarach</b> , <b>Benzoin</b> , <b>Asafetida</b> , <b>Myrrh</b> , <b>Olibanum</b> , <b>Aloes</b> , <b>Gulac</b> , <b>Dragon's blood</b> , <b>Kino</b> , <b>Peru Balsam</b> , <b>Tolu</b> , <b>Copalba</b> , <b>Storax</b> and <b>Gamboge</b> are resins, gum resins or extracts from the juices of plants.	Gum resins and resins of many kinds are used in varnishes, medicines, incense, etc.	Such forest products are gathered in nearly all countries.	Not of so much relative commercial importance as such materials were in the middle ages.
<b>Rubber</b> is the milky juice (latex) of many trees and vines of the tropics and subtropics. ( <i>Hevea</i> , <i>Manihot</i> , <i>Castilloa</i> , <i>Ficus</i> , <i>Landolphia</i> , etc.). Fr., <i>Caoutchouc</i> , <i>Gomme elastique</i> ; Ger., <i>Kautschuk</i> , <i>Federholz</i> ; Sp., <i>Caucho</i> , <i>Hule</i> , <i>Goma elastica</i> .	Crude India rubber, or <i>caoutchouc</i> , has dozens of commercial varieties differing greatly in quality according to the nature of the plant and the process of preparation ( <i>Para</i> , <i>Ceylon</i> , <i>Central American</i> , <i>African</i> , <i>Ceylon</i> , <i>plantation</i> , etc.). Crude rubber is treated with sulphur (vulcanized) to make elastic and waterproof articles, as well as hard rubber goods (vulcanite and ebonite). Substitutes for rubber are made from rapeseed oil, corn oil, etc.	The largest supplies of rubber come to market from the Amazon valley. <i>Para</i> rubber is prepared by smoking (drying) the latex over a fire. The latex is coagulated often by simple drying in the air and frequently by chemical or mechanical processes. Mexico and Central America, Africa and the East Indies furnish large amounts. Most of the world's supply comes from wild trees. Every year there is a larger production from plantations, and much of this, like the Ceylon rubber, is of very fine grade and brings the highest market price.	Rubber has, within a very few years, become an important article in the world's commerce. Its uses are multiplied and its price has risen in proportion. Factories in Europe and America make automobile tires, rubber bands, elastic cloth, toys, shoes, tubing, hose, waterproof cloth, stoppers, erasers, etc., as well as articles of hard rubber, such as combs, buttons, surgical and chemical appliances. Rubber is used in floor cloths, cements and varnishes. Old rubber articles are worked over and the reclaimed rubber utilized.
<b>Gutta-Percha</b> is from the milky juice of a tree ( <i>Diospyros</i> species). Fr., and Ger., <i>Gutta-Percha</i> ; Sp., <i>Guta-Percha</i> .	Similar in some ways to rubber.	From the East Indies.	Used to insulate submarine cables and for making golf balls. Singapore is the chief port of shipment.
<b>Balata</b> is similar.			
<b>Chicle</b> is from the milky juice of a tree ( <i>Achras zapota</i> ). Fr., Ger. and Sp., <i>Chicle</i> .	Chicle is called also <i>gum chicle</i> , or <i>crude chering gum</i> .	Chiefly from Yucatan.	Used in chewing gum.

OILS, FATS AND WAXES

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>See Cotton, Corn, Olive, Flax, Hemp, Coconut, Cacao</b> for other oils. See also various animal oils and petroleum.	Vegetable oils are of two important types, <i>fixed</i> or <i>fatty</i> oils and <i>volatile</i> or <i>essential</i> oils. Fixed oils are either <i>drying</i> oils like <i>linseed</i> or <i>non-drying</i> like <i>olive</i> .	Fixed oils are obtained from seeds by pressure in powerful machinery or by chemical processes. The oil-cake remaining is used for cattle food and fertilizer.	Drying oils are used to paints and varnishes, preparing leather, etc. Non-drying oils are used for table purposes, cooking, illuminating, lubricating, soap and candle making, etc. <i>Glycerine</i> is a by-product in soap making.
<b>Castor Oil</b> is from the seeds of the castor plant ( <i>Ricinus communis</i> ). Fr., <i>Huile de ricin</i> ; Ger., <i>Ricinusöl</i> ; Sp., <i>Acetie de ricino</i> .	The cold drawn or cold pressed oil is used in medicine. Much castor oil is treated with sulphuric acid to produce <i>Turkey red oil</i> for use in dyeing and calico printing.	The largest production is in India. Grown in the tropics and warm temperate climates.	Used in soap making, lubricating, preparing artificial leather and celluloid.
<b>Palm Oil</b> is from the pulp and seeds of a palm ( <i>Elaeis guineensis</i> ). Fr., <i>Huile de palme</i> ; Ger., <i>Palmöl</i> ; Sp., <i>Acetie de palme</i> .	Palm oil is from the pulp, palm kernel oil from the seeds.	From the coast of the gulf of Guinea, West Africa.	For making soap and candles, and used in the preparation of tinsplate.
<b>Peanut Oil</b> , <i>sunflower</i> , <i>almond</i> , <i>sesame</i> , <i>poppy</i> , <i>rape seed</i> , <i>kapok</i> , <i>soy bean</i> and various other oils are used.		Seeds for oil production are little cultivated in India with the exception of flaxseed, cotton and cora.	Marseilles, Rotterdam, and several other European cities have great mills for the production of vegetable oils of this character.
<b>Essential Oils</b> are made chiefly from flowers and leaves of plants.	<i>Attar of roses</i> , <i>patchouli</i> , <i>lavender</i> , <i>cloves</i> , <i>lemon</i> , <i>orange</i> , <i>ananas</i> , <i>peppermint</i> , <i>citronella</i> , <i>lemon grass</i> , <i>cinamon</i> , <i>bay</i> , <i>almond</i> , <i>caraway</i> and many others are prepared.	Fragrant oils are prepared in large amount for the perfumery trade in France, Italy, Germany and Austria, from roses, violets and other cultivated plants. <i>Peppermint</i> oil is produced in the United States, and it, as well as <i>menthol</i> , comes from Japan.	These oils are obtained by distillation of the plants with water or else by absorbing the fragrance in <i>lard</i> or <i>oil</i> (essence). They are used in perfumery, for flavoring and in medicine.
<b>Camphor</b> is from the wood of the camphor tree ( <i>Cinnamomum camphora</i> ). Fr., <i>Camphre</i> ; Ger., <i>Kampher</i> ; Sp., <i>Alcanfor</i> .	Although called <i>gum camphor</i> , this is strictly a volatile or essential oil.	From Formosa, Japan, China and Borneo. Prepared by distilling the wood with water.	Nine-tenths of the world's supply is exported from Formosa. Its production is a monopoly of the Japanese government. Used in making celluloid and smokeless powder, in medicine and as a protectant against insects.

## OILS, FATS AND WAXES—Continued

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Vegetables Waxes</b> are from myrtleberries ( <i>Myrica</i> species), Japanese waxberries ( <i>Rhus</i> species) or the leaves of the carnauba palm ( <i>Copernicia cerifera</i> ). Fr., <i>Cire végétal</i> ; Ger., <i>Vegetabilisches Wachs</i> ; Sp., <i>Cera vegetal</i> .	<i>Myrtleberry</i> or <i>Bayberry</i> wax, Japan wax and carnauba wax are much like beeswax in their nature and uses.	Japan wax is produced only in Japan. Carnauba wax is from Brazil.	These waxes are found in commerce but are not of great importance.

## DYESTUFFS AND TANNING MATERIALS

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Logwood</b> ( <i>Hæmatoxylon campechianum</i> ).—Fr., <i>Campeche</i> ; Ger., <i>Kampeschholz</i> ; Paribolt; Sp., <i>Palote Campeche</i> . <b>Brill wood</b> ( <i>Cassipoula</i> species).—Fr., <i>Bois de Brésil</i> ; Ger., <i>Branholz</i> ; Sp., <i>Madera de Brasil</i> . <b>Fustic</b> , <b>Young Fustic</b> , <b>Sappan</b> , <b>Cam</b> , <b>Bar</b> , <b>Peach</b> and other woods. <b>Indigo</b> is obtained from the juice of the indigo plants (mostly <i>Indigofera</i> species). Fr., <i>Indigo</i> ; Ger., <i>Indigo</i> ; Sp., <i>Añil</i> , <i>Indigo</i> .	Handled commercially in chips, or very commonly in the form of extract.	From the forests of tropical America and the West Indies.	Azulin and other azulin dyes have increased the demand for these, as well as almost all other vegetable dyes. There is still a fairly large trade in logwood.
<b>Madder</b> , <b>Anatto</b> , <b>Safflower</b> , <b>Queritron</b> , <b>Turmeric</b> , <b>Turnsole</b> , <b>Persian Berries</b> , <b>Saffron</b> , <b>Archil</b> , <b>Cudbear</b> , <b>Litmus</b> , <b>Wood</b> and many other vegetable substances are used as dyes.		India, Ceylon, Java and Central America are the chief producers. Formerly cultivated much more extensively.	Prepared by soaking the plants in water. The green solution turns blue on exposure to the air, the indigo separates and falls to the bottom of the tank.
<b>Tanbarks</b> are from many species of trees.	<i>Hemlock</i> , <i>white oak</i> , <i>willow</i> , <i>mangrove</i> , <i>larch</i> and <i>willow</i> are used.	Obtained mostly as by-products of lumber industry. In the United States, hemlock is most important.	Extracts from the bark are usually prepared and the material is found in commerce in this form. The value is largely dependent on the percentage of tannin.
<b>Tanning extracts</b> are prepared from many woods, fruits, leaves, roots and galls.	<i>Oak</i> , <i>chestnut</i> , <i>quebracho</i> and <i>cutch</i> are extracts from wood. <i>Myrobala</i> , <i>salicina</i> , <i>div-diti</i> and <i>algarobilla</i> are fruits yielding tannin. <i>Sunaw</i> and <i>gambel</i> leaves, <i>cassare</i> and <i>palmetto</i> roots and <i>oak</i> and <i>sumac</i> galls are all employed.	Obtained in nearly all parts of the world.	Different substances or extracts are employed in preparing different qualities of leather.

## MISCELLANEOUS SUBSTANCES

NAME OF RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Vegetable Ivory</b> is the seed of a palm tree ( <i>Phytolapha</i> species). Fr., <i>Ivoire végétal</i> ; Ger., <i>Holzelfenbein</i> ; Sp., <i>Corato</i> , <i>Tagua</i> .	Other species of palm produce vegetable ivory in the South Sea islands.	From Ecuador, Colombia and Panama.	Used for making buttons, etc. Exported to United States and Europe.
<b>Argols</b> , a deposit in wine casks. Fr., <i>Tartre</i> ; Ger., <i>Weinstein</i> ; Sp., <i>Tártaro</i> .	<i>Apical</i> or <i>tree</i> are the only source of tartaric acid and tartarates.	Principally from Portugal.	Used in dyeing, making baking powder, cream of tartar, acidule powders and tartar emetic.
<b>Lycopodium</b> powder consists of the spores of certain mosses. Fr., <i>Lycopode</i> ; Ger., <i>Lycopodium</i> , <i>Barlapp</i> ; Sp., <i>Licopodio</i> .		Exported from Russia.	Used in fireworks and by pharmacists.
<b>Pyrethrum</b> is the powdered flowers of a plant allied to the chrysanthemum. ( <i>Pyrethrum</i> species).	Used in insect powders.	From Persia and southeastern Europe.	

## ANIMAL PRODUCTS

ANIMAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Cattle</b> are of several important types. The most abundant is the domestic ox ( <i>Bos taurus</i> ). Fr., <i>Bœuf</i> ; Ger., <i>Rindvieh</i> ; Sp., <i>Ganado</i> . The Indian Humped Ox and the Water Buffalo are raised in the East.	<i>Beef</i> , fresh, dried, salted, canned or otherwise preserved is the most valuable of all cattle products. <i>Hides</i> (including skins and calfskins) are second only to beef in importance. <i>Milk</i> is sold fresh, condensed, evaporated, or is made into butter, cheese, cream and sugar of milk. <i>Horns</i> , <i>hoofs</i> and <i>bones</i> are used for buttons, handles for knives, brushes, umbrellas and fancy articles, or made into gelatine and glue. <i>Tallow</i> from leaf fat is used in food, soap, candles and lubricants. <i>Oleo</i> and <i>lard</i> are from tallow and are used in making oleomargarine or butterine. <i>Xen's food</i> oil is a lubricant. <i>Dried blood</i> is used in purifying sugar, clarifying wines, and in dyeing. <i>Cow hair</i> is mixed in plaster. <i>Feathers</i> and <i>penne</i> are made from the stomach. All waste parts go into fertilizer.	The United States, Russia, India, Argentina, Germany, Austria-Hungary, France and Australia are the greatest cattle raising countries. In this country, the cattle raising area has moved rapidly westward. More than half of the beef cattle are now found in Texas, Iowa, Missouri, Kansas, Nebraska, Colorado and Wyoming. They are fattened in the corn belt (Illinois, Iowa, Nebraska, Kansas) and killed in the slaughter houses of Chicago, Kansas City, St. Louis and Omaha. The by-products of slaughtering are very numerous and the industry is conducted so economically that, in the great slaughter houses, no part of the animal is wasted. In some parts of the world hides and tallow are the chief products of the cattle industry on account of the difficulty of transporting the meat.	The United States, Argentina and Australia are the greatest exporters of live cattle and beef. Great Britain buys the greater part of the cattle products reported by the United States. Refrigerator cars and cold storage in steamships make possible the shipment of fresh meat to long distances. Fresh meat is a growing export from Argentina, Australia, New Zealand and South Africa to Europe. The dairy industry is of growing importance and New Zealand exports butter and cheese to England, Denmark, Sweden, Holland, Switzerland, Canada and Australia export dairy products. Notwithstanding the large production of hides in the United States, our tanning industry is so large that millions of dollars worth are annually imported, chiefly from South America. Sole leather is made from cattle hides. Leather is split and finished in a great number of styles.

ANIMAL PRODUCTS—Continued

ANIMAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Sheep</b> ( <i>Ovis aries</i> ) are of a great number of breeds (Merino, Lincoln, Leicester, Southdown, Highland, etc. Fr., <i>Moutons</i> ; Ger., <i>Schafe</i> ; Sp., <i>Carneros</i> ).	Wool is the most valuable product of the sheep. The grades of wool are named according to the breed of sheep, the locality and the use to which they may be put. Clothing wools are fine and comparatively short, combing wools are of medium length, carpet wools are long and coarse. Meat (mutton and lamb) is of less importance than beef and pork. Sheep and lamb skins are used with the wool on, for rugs and furs (Persian lamb, broddell, Astrakhan, Tibet). Skins (roasts) are tanned for Morocco and fancy leather. Chamels is usually oil-tanned sheepskin. Catgut is made of sheep intestines, tallow from the fat, cheese from the milk and fertilizer of all waste. The meat is by far the most valuable product. It is sold fresh, salted, pickled and smoked and in the form of ham, bacon and sausage. Lord, lard oil, stearin, and other fats and oils are obtained from the fat. The skins are made into leather and all waste parts are utilized in fertilizers or converted into prussiate (cyanide) of potash. Bristles come chiefly from China and Russia, where pigs have not been improved by breeding. Angora and Cashmere are breeds which produce exceptional quality of hair. The hair from the common goat is coarse and is used in making carpets and blankets. Goat and kid skins are the most valuable products of these animals. Camel hair is the only product which enters into general commerce. Locally the flesh, milk and hide are utilized.	Raised chiefly in temperate countries, in largest numbers in Australia, Argentina, Uruguay, Russia and the United States. The finest wools are raised in Germany, Argentina, Australia, South Africa, and the United States. Combing wools come from England, Scotland, France, Austria and the United States. Carpet or native wools are produced in Russia, Asia Minor and China from sheep of unimproved breed. Sheep raising is an industry appropriate to a fairly open, temperate country which is sparsely settled. For this reason it has prospered in the western United States, Argentina, Australia, New Zealand and South Africa, where good breeds of sheep have been introduced.	Within the past hundred years, cotton has displaced wool as the most important commercial textile fiber. Wool is carded and spun into wools yarns or combed and spun into worsted yarns. Woolens and worsteds are the two types of wool fabrics. Cotton is very largely mixed with wool to cheapen the product. The United Kingdom, Germany and France supply the world with dupions and worsted fabrics. The United States mills supply mainly the home market. Nearly all the factories are in New England and the Middle states. Live sheep are exported from Argentina, Australia, the United States and Canada, but a large value is represented in frozen mutton, which goes in refrigerator ships from New Zealand, Australia and Argentina to Europe.
<b>Swine</b> are of many breeds ( <i>Sus scrofa</i> ). Fr., <i>Cochon</i> ; Ger., <i>Schwein</i> ; Sp., <i>Puerco</i> , <i>Cochino</i> .	Pigs are raised in almost all parts of the world, but the hog raising industry is greatest in the United States. Corn is the food which is most important in fattening the animals for market.	Pigs are raised in almost all parts of the world, but the hog raising industry is greatest in the United States. Corn is the food which is most important in fattening the animals for market.	Chicago, Kansas City and Omaha are the chief pork packing centers. Probably is no other industry is every by-product more completely utilized. Hog products constitute one of the most valuable of this country's exports, greatly exceeding the value of even cattle products.
<b>Goats</b> are less varied in their breed than many other domestic animals ( <i>Capra</i> species). Fr., <i>Chèvre</i> ; Ger., <i>Zeige</i> ; Sp., <i>Cabra</i> .	The greatest number of goats are raised in western Asia. There are many in southern Europe and northern Africa. Angora goats are raised in Asia Minor, South Africa, Texas and Australia. Swiss goats are raised for their milk, and cheese made from it.	The greatest number of goats are raised in western Asia. There are many in southern Europe and northern Africa. Angora goats are raised in Asia Minor, South Africa, Texas and Australia. Swiss goats are raised for their milk, and cheese made from it.	Large numbers of goat and kid skins are imported into the United States, chiefly from the East, South America and South America. These are largely tanned with chrome to make glazed kid and soft leather. Other products, Morocco and glove leather are prepared.
<b>Camels</b> ( <i>Camelus</i> species) are of two types, the one-humped or dromedary, and the two-humped or Bactrian. Fr., <i>Chameau</i> ; Ger., <i>Kamel</i> ; Sp., <i>Camello</i> .	Camels are found throughout central Asia and northern Africa. Camel hair comes chiefly from interior Asia.	Camels are found throughout central Asia and northern Africa. Camel hair comes chiefly from interior Asia.	The hair or wool is soft and suitable for making hosiery, underwear and shawls.
<b>Alpaca</b> is an animal similar to the camel ( <i>Auchenia pacos</i> ). Fr., <i>Alpaga</i> ; Ger., and Sp., <i>Alpaca</i> .	Imported into Europe and United States.	Raised in Peru.	Imported into Europe and United States.
<b>Horses</b> are chiefly beasts of burden ( <i>Equus caballus</i> ). Fr., <i>Cheval</i> ; Ger., <i>Pferde</i> ; Sp., <i>Caballos</i> .	Horsehair is from manes and tails. Hides are tanned to make leather. Pony skins are used as furs.	Horsehair is exported chiefly from Russia, Argentina, Germany, and other countries.	The hair is used for making haircloths and brushes, and for stuffing mattresses and furniture.
<b>Wild Animals</b> of many kinds are killed for the sake of their skins.	Important furs are obtained from the sable, fox, weasel, marten, ermine, mink, skunk, raccoon, bear, otter, beaver, muskrat, seal, nutria, squirrel, chinchilla, mole, monkey, rabbit, etc.	Good furs come mostly from Siberia, Russia and British America, with the exception of skins of the monkey and cat families.	London and Leipzig are the world's great fur markets. Skins of the domestic cat are dyed and dressed so as often to resemble more costly fur. Rabbits are similarly altered. Great numbers of rabbit skins are imported from Australia and New Zealand to the United States and the fur from them is used in making felt hats. Nutria fur is used for the same purpose.
<b>Other Animals</b> furnish products of value.	Ivory is chiefly from the tusks of African and Indian elephants.	Deer horns for knife handles, etc., come from many parts of the world. Deer skins are tanned for leather.	Musk, a perfume, comes from the musk ox in Asia. Castoreum from the beaver and civet, from the civet cats of Africa and Asia, are the bases for perfumes.
<b>Whales</b> are of several species ( <i>Balaena</i> , <i>Physeter</i> ). Fr., <i>Baleine</i> ; Ger., <i>Wal-fisch</i> ; Sp., <i>Ballena</i> .	Whale oil (sperm oil) is drained from the blubber of <i>Physeter</i> is from the mouth, spermaceti from the blubber and cavities in the head and ambergris from the intestines. Porpoise leather is from the skin of the white whale.	The Greenland fishery is most important, but whaling is not as prosperous an industry now, as it was one hundred years ago. This is largely because of the scarcity of whales and partly because kerosene is so generally used for illuminating.	Whale oil is used in leather dressing, boring, soap making and lubricating. Spermaceti is used in candle making and for waxing carriage covers; whalebone for corset and dress, making brushes and whips; and ambergris in perfumes.
<b>Sponges</b> are the skeletons of peculiar animals ( <i>Spongia</i> ). Fr., <i>Eponge</i> ; Ger., <i>Schwamm</i> ; Sp., <i>Esponja</i> .	The qualities differ with the species and locality.	Obtained in the Mediterranean and West Indies.	Imported largely from the eastern Mediterranean.
<b>Fish</b> are of hundreds of species but there are comparatively few that are of great commercial importance. Fr., <i>Poisson</i> ; Ger., <i>Fisch</i> ; Sp., <i>Pescado</i> .	Of the food fish, cod, haddock, herring, sardines, mackerel and salmon are handled in large quantities fresh, canned, salted or otherwise cured. Caviar is the prepared roe of sturgeon. Jaspelin is a pure gelatine made from the swimming bladders of sturgeon and other fish.	The great fisheries of the world are the "Grand Banks" off Newfoundland, the North Sea and the coast of Norway. Salmon are canned on the northwest coast of America and on a smaller scale in Japan, Siberia and Norway. Portugal, Spain and France lead in canning sardines. Oil, made from mackerel and other fish are used in preparing leather, in paints, oiling ropes, etc. Cod liver oil is used in preparing chamams and other leather and in pharmacy.	Canned salmon leads in value over exports of fish products, and goes mainly to England. We import herring, etc., in oil from Europe and considerable quantities of fresh or canned lobsters from New Scotland. Fish bones are prepared from the refuse from fish canneries and from fish which are not otherwise useful.

## ANIMAL PRODUCTS—Continued

ANIMAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND CULTIVATION	MANUFACTURE, USES AND TRADE
<b>Oysters</b> are the most valuable shellfish. ( <i>Ostrea</i> species, <i>Meleagrina</i> , etc.) Fr., <i>Ouïres</i> ; Ger., <i>Auster</i> , <i>Austern</i> ; Sp., <i>Ostras</i> .	Oysters are gathered on the coasts of Europe and America. Some are canned but the greater amount are consumed fresh. Pearl oysters ( <i>Meleagrina</i> ) supply mother of pearl and occasionally true pearls. Abalone ( <i>Haliotis</i> ) and various mussel shells are also used.	Pearl oysters are found off the coasts of Ceylon, Society Islands, northern Australia, Panama, in the Gulf of California, the Red Sea and the Persian gulf. Abalone shells come from the shores of the Pacific.	Pearl shell is used for buttons, knife handles, etc. Mother of pearl is imported largely from the South Pacific.

## PRODUCTS OF BIRDS

RAW MATERIAL	CHIEF COMMERCIAL ARTICLES PRODUCED	HABITAT AND PRODUCTION	MANUFACTURE, USES AND TRADE
<b>Eggs</b> are chiefly from the domestic fowl. Fr., <i>Oeufs</i> ; Ger., <i>Eier</i> ; Sp., <i>Huevos</i> .	Avoids from their use as food, eggs supply egg albumen. Large numbers are bought in the spring and summer and preserved by cold storage.	There is a large and increasing foreign trade in fresh eggs.	Eggs are used in preparing tanned leather for gloves, etc.; and egg albumen is photographic paper, clarifying sugar, etc.
<b>Feathers</b> and bird skins are from many kinds of wild and tame birds. Fr., <i>Plumes</i> ; Ger., <i>Federn</i> ; Sp., <i>Plumas</i> .	Ostrich, cock, goose, duck, turkey, pheasant, heron, grebe, and many wild birds furnish plumes for decorative purposes.	Ostrich feathers are obtained by killing wild birds in central Africa and from ostrich farms in South Africa. Smaller quantities come from North Africa, Argentina and California. Down, for pillows and feather beds, is from the domestic goose. From dry islands and caves.	The United States imports feathers and down chiefly from Europe. The greater part of the supply of ostrich feathers comes from South Africa, and from California ostrich farms.
<b>Guano</b> is the accumulated excrement of birds and bats. Fr., Ger. and Sp., <i>Guano</i> .	A valuable fertilizer. Refuse from fish canneries and oil factories goes under the name of fish guano.		Exported mainly from islands in the Pacific.

## INSECT PRODUCTS

<b>Silk</b> is from the cocoons of the cultivated silkworms ( <i>Bombyx mori</i> ). Fr., <i>Sole</i> ; Ger., <i>Seide</i> ; Sp., <i>Seda</i> . Pongee and other wild silks are produced by insects of different species ( <i>Antheraea</i> ).	<i>Silk cocoons</i> are reeled to obtain raw silk. The unreelable parts of the cocoons are silk waste, which is converted into spun silk. Raw silk is "thrown" or twisted giving tram and organzine for weaving.	Silkworms are reared and cocoons produced commercially only in China, Japan, India and Mediterranean countries, particularly Italy, southern France, Greece, Turkey and western Asia. Here, cheap and competent labor can be obtained and it cannot in any other part of the world where the climate is favorable. The reeling of the raw silk from the cocoon is largely conducted in modern factories.	China exports almost half the raw silk of commerce. Japan and Italy each export less than half as much as China. The United States leads the world in the quantity of silk manufactured. France uses almost as much raw silk and makes fabrics of high grade. More than half the raw silk imported into the United States comes from Japan. We import silk fabrics in large amounts from France, Germany and Switzerland.
<b>Honey</b> (Fr., <i>Miel</i> ; Ger., <i>Honig</i> ; Sp., <i>Miel</i> ) and <b>Beeswax</b> (Fr., <i>Cire de abeilles</i> ; Ger., <i>Bienenwachs</i> ; Sp., <i>Cera de las abejas</i> ) are produced by the honey bee ( <i>Apis mellifica</i> ).	<i>Honey</i> is sold either in the comb or extracted. <i>Beeswax</i> is obtained by melting the comb. Beeswax is adulterative and imitated by the use of paraffin, stearine, and vegetable waxes. Wax is used for candles, waxing floors and thread, artificial plants, salves, etc.	Honey and wax are produced in northern Europe and the United States.	Most honey is shipped from California to other parts of the United States and Europe. Beeswax is imported from Europe and South America.
<b>Lac</b> is a resinous substance formed on twigs by the lac insect ( <i>Coccus lacca</i> ). Fr., <i>Laque</i> ; Ger., <i>Lack</i> ; Sp., <i>Laca</i> .	<i>Stick lac</i> is the crude material as gathered from the trees. <i>Shell lac</i> and <i>button lac</i> are partly purified. <i>Red lac dye</i> is a by-product now of little importance or value. <i>Orange shellac</i> is bleached to make white shellac.	From forests of northern India and Indo-China.	Dissolved in alcohol to make varnishes. Used in sealing wax, putty, for maling paper, stiffening felt hats, etc.
<b>Cochineal</b> consists of the dried bodies of insects ( <i>Coccus cacti</i> ). Fr., <i>Cochenille</i> ; Ger., <i>Cochenille</i> ; Sp., <i>Cochinilla</i> .	Used as a red dye for wool.	Raised on cactus plants in Mexico, Central America, Tenerife, and the East Indies.	Of little present importance due to the extensive use of dyes from coal tar.
<b>Cantharides</b> are the dried bodies of beetles ( <i>Cantharis</i> , <i>Mylabris</i> , etc.) Fr., <i>Cantharides</i> ; Ger., <i>Kan-thariden</i> ; Sp., <i>Canthridas</i> .	Cantharides, Spanish flies and Chinese blistering beetles are similar.	From southern Europe, India and China.	Used medicinally for blistering purposes, and internally as a stimulant to the urinary organs.

## MINERAL PRODUCTS

METALS	ORES AND CHIEF PRODUCTS	LOCALITY AND PREPARATION	MANUFACTURE, USES AND TRADE
<b>Iron</b> is the most useful metal. Fr., <i>Fer</i> ; Ger., <i>Eisen</i> ; Sp., <i>Hierro</i> .	<i>Hematite</i> (sesquioxide of iron) is the ore which supplies three fourths of the iron of commerce. Limonite brown (hematite) is a hydrous oxide and furnishes nearly one-fourth of the world's supply of the metal. Magnetite and siderite are less common ores. <i>Pig iron</i> is the crude form of the refined metal and is transformed into cast iron, wrought iron and steel in their multitudinous forms. These three forms of iron differ in hardness, strength, elasticity, malleability, etc., according to the amount of carbon, sulphur, phosphorus, manganese and other elements. <i>Oxides</i> and metallic paints are iron oxides. <i>Prussian blue</i> and <i>copperas</i> are iron compounds. <i>Pyrrite</i> (iron pyrites or fool's gold) is a sulphide of iron, useless as an iron ore.	The United States, Germany, Great Britain, Spain and France are the greatest producers of iron. Its ores occur in almost all parts of the world. Hematite is mined in Minnesota, Michigan, Alabama and other parts of the United States and in Germany, England, France, Spain, Russia, etc. Limonite is also widely distributed. <i>Pig iron</i> is made by smelting iron ore in a blast furnace. The ore, mixed with limestone, is melted by burning coke, coal or charcoal. <i>Pyrrite</i> is found in Spain and many other parts of the world and is valuable in the preparation of sulphuric acid (oil of vitriol).	The United States manufactures more iron and steel than any other country. Almost half of the production is in Pennsylvania. Cast iron appears in many articles but is weaker than other forms of iron. Wrought iron contains less impurity and is used for bars, plates, wire, structural material and parts of machinery. Steel (Bessemer, Siemens-Martin, open hearth, etc.) contains more carbon than wrought iron, possesses both strength and hardness, and is used for rails, structural material, machinery, tools, wire rope, sheet steel, etc. Its hardness may be increased by tempering. The United States imports iron ore from Cuba and Spain, pig iron from the United Kingdom and a little manufactured iron and steel from Europe. We export large quantities of manufactured iron and steel.

MINERAL PRODUCTS—Continued

METALS	ORES AND CRUDE PRODUCTS	LOCALITY AND PREPARATION	MANUFACTURE, USES AND TRADE
<b>Lead</b> is the softest, heaviest, most malleable and most easily melted of the common metals. Fr., <i>Plomb</i> ; Ger., <i>Blei</i> ; Sp., <i>Plomo</i> .	<i>Galena</i> (lead sulphide) is the only important ore; it often carries a considerable percentage of silver. Carbonates and sulphates of lead are less common. <i>Siderite</i> and <i>type metal</i> are alloys of lead with tin and antimony. <i>White lead</i> is a carbonate of lead and is a white powder. <i>Red lead</i> is a sesquioxide of lead and is a red powder. <i>Chrome yellow</i> and <i>chrome mineral</i> are red compounds used as pigments.	Ores are found in many countries but the main supply is from the United States, Spain, Germany and Mexico. The chief lead mines of the United States are in Missouri, Idaho, Utah, Colorado and Kansas. Much lead bullion is from smelters where silver ores are reduced.	The chief use of metallic lead is in piping, sheet lead, shot and alloys. Large amounts of ore are transformed not into metallic lead but into white lead for use in paints. Lead ore and lead bullion are imported from Mexico, England is the greatest importer of lead and lead ore.
<b>Zinc</b> is one of the most useful metals. Fr., <i>Zinc</i> ; Ger., <i>Zink</i> ; Sp., <i>Zinc</i> .	<i>Sphalerite</i> or <i>blend</i> (zinc sulphide) is the chief ore. Most of the zinc is obtained from the zinc sulphide. Zinc and oxides of zinc are found. Crude zinc (specie) is distilled from roasted ore. <i>Brass</i> , German <i>zinc</i> and other alloys contain zinc. <i>Galvanized iron</i> consists of a coating of zinc on sheet iron. <i>Zinc oxide</i> (zinc white) resembles white lead and is used in paints.	Germany, United States and Belgium supply most of the zinc. In this country, Missouri and Kansas lead in zinc production.	Used in electric batteries, making hydrogen, fine steels, etc. The greatest amount of zinc is used in alloys and zinc compounds. Zinc and zinc ores are both imported and exported by the United States, the imports exceeding the exports. Zinc oxide is exported in larger amount than any other form.
<b>Copper</b> is, next to iron, the most important metal in use. Fr., <i>Cuivre</i> ; Ger., <i>Kupfer</i> ; Sp., <i>Cobre</i> .	There are many ores. <i>Chalcocite</i> , and <i>bornite</i> , (copper sulphide of copper and iron) are widely distributed. <i>Chalcocite</i> (copper sulphide) is mined in Montana, malachite and azurite (carbonates of copper) in Arizona and metallic copper in Michigan. <i>Copper matte</i> is the crude metal as it comes from the smelter. <i>Brass</i> and <i>bronze</i> are alloys of copper with zinc, tin, aluminium, etc. <i>Copper sulphate</i> (blue vitriol) is the most important chemical compound of copper.	The greatest production is in the United States, in Arizona, Montana, Michigan, and Utah. Spain, Japan, Chili, Australia and Germany produce smaller amounts. The metal is purified by smelting, and refined, often by electrolytic methods.	The value of copper has increased within recent years, due to its enormous use in electrical work. Aside from this, copper is employed in large amount in the various alloys into which it enters, and in coils, utensils, printing plates, etc. Copper sulphate is extensively used in electrical apparatus, dyes, chemical work and as an antiseptic. Large amounts of manufactured copper are exported to Europe. Chiefly for the titles of ores, matte and regulus are imported from Mexico, South America and other countries. Copper wire is extensively used by telephone and telegraph companies.
<b>Gold</b> is the standard precious metal. Fr., <i>Or</i> ; Ger., <i>Gold</i> ; Sp., <i>Oro</i> .	Gold ore are usually gravels or beds of quartz rock in which the metal occurs in small particles. <i>Chloride of gold</i> , used in photographic work, is its only important compound. Pure gold is called 24 carats fine. A smaller figure indicates that the metal is alloyed to harden it.	Found in nearly all parts of the world. South Africa and the United States are the leading producers. Australia, South America and parts of Europe possess important gold fields. Gold is separated from gravel (placer mines) by washing with water. The particles of metal, being heavy, sink and can be collected. Rock containing gold is crushed to fine powder and the gold combined with mercury (amalgamation). Low-grade ores are treated with a solution of cyanide of potassium which dissolves the gold and the metal is later separated.	Gold is used for money, jewelry, gold leaf (gilding) and in dentistry. It is almost always alloyed with copper and silver. Gold is the world's accepted standard of value. Shipments of gold go from one country to another chiefly to balance international business dealings. Government treasuries and bank vaults are the chief storehouses for gold, either as bullion or coin.
<b>Platinum</b> is a rare metal. Fr., <i>Platine</i> ; Ger., <i>Platin</i> ; Sp., <i>Platina</i> .	Found in gold, iridium and other rare metals in placer mines.	Chiefly from Russia. Smaller amounts from Colombia, California, Canada and Australia.	Used in the terminals of incandescent electric lamps. Also employed by chemists, jewelers and dentists.
<b>Silver</b> is the common precious metal. Fr., <i>Argent</i> ; Ger., <i>Silber</i> ; Sp., <i>Plata</i> .	<i>Argentiferous galena</i> (lead ore) is the commonest ore of silver. The amount of silver per ton varies greatly. Zinc and copper ores often carry silver. Many sulphides of silver (argenticite, pyrrargyrite, etc.) are found, as well as chlorides and bromides (cerargyrite and bromargyrite). <i>Chloride and azurite of silver</i> are used in photography. <i>Cinnabar</i> (sulphide of mercury) is the source of the metal, although a little is found in nature in the pure state. <i>Vermilion</i> (artificially prepared cinnabar) is used in paint. <i>Calomel and corrosive sublimate</i> are used in medicine and <i>fulminate of mercury</i> in explosives. <i>Bauxite</i> (aluminium hydrate) is the only ore. <i>Cryolite</i> (fluoride of aluminium and sodium), a mineral mined only in Greenland, was formerly used as an ore but is now utilized in the manufacture of alum and soda. <i>Alum</i> (a sulphate) is made from cryolite or clays. <i>Corundum</i> (aluminium oxide) is, next to diamond, the hardest natural mineral. <i>Sapphire and ruby</i> are transparent forms suitable for gems. <i>Emerald</i> is an impure form of corundum. <i>Feldspar</i> is a silicate of aluminium with other metals.	Silver is produced in greatest amount in the Rocky mountains and the Andes. The United States, Mexico, Australia, Bolivia, Chili, Peru and Germany furnish nearly the entire supply. Montana, Colorado, Nevada and Utah lead in silver production in the United States. The ore are usually smelted and refined to purify the metal.	Manufactured into innumerable articles for household use and personal adornment. The cheapest are not solid (sterling) but are electrically plated with a very thin coating of silver. Silver coins form the bulk of the currency of the world, although in most countries gold is the standard.
<b>Mercury</b> (or quick silver) is a heavy metal which is liquid at ordinary temperatures. Fr., <i>Mercur</i> ; Ger., <i>Merkur</i> , <i>Quecksilber</i> ; Sp., <i>Mercurio</i> .	Produced in Spain, the United States, Austria, Italy and Russia. California supplies most of this country's quota. Obtained by distillation of the ore.	Produced in Spain, the United States, Austria, Italy and Russia. California supplies most of this country's quota. Obtained by distillation of the ore.	Used principally in the extraction of gold and silver from their ores by amalgamation. Employed in thermometers and barometers, silvering mirrors, and in making amalgams for dental work. Half of the mercury produced in this country is exported to Mexico, Central America and China.
<b>Aluminium</b> (or aluminum) is the lightest metal in common use. Fr. and Ger., <i>Aluminium</i> ; Sp., <i>Aluminio</i> .	<i>Bauxite</i> (aluminium hydrate) is the only ore. <i>Cryolite</i> (fluoride of aluminium and sodium), a mineral mined only in Greenland, was formerly used as an ore but is now utilized in the manufacture of alum and soda. <i>Alum</i> (a sulphate) is made from cryolite or clays. <i>Corundum</i> (aluminium oxide) is, next to diamond, the hardest natural mineral. <i>Sapphire and ruby</i> are transparent forms suitable for gems. <i>Emerald</i> is an impure form of corundum. <i>Feldspar</i> is a silicate of aluminium with other metals.	Bauxite is mined in France, Ireland, Austria, Arkansas, Alabama and Georgia. Aluminium is refined by electric processes, the works in America being located near Niagara Falls.	Used largely as an addition to iron and steel, preventing bubbles and waste in castings. Used in electrical work and for purposes where a light, strong metal is necessary, as in certain machinery, hulls for submarines, etc. Refineries are located in Switzerland, France and Great Britain.
<b>Clay</b> is chiefly silicate of aluminium and other metals. <i>Kaolin</i> is its purest form. The properties of clay vary with its composition. <i>China clay</i> , <i>fire clay</i> , <i>pipe clay</i> , <i>brick clay</i> , etc.	<i>Feldspar</i> is a silicate of aluminium with other metals.	Mined in Canada, Pennsylvania, Connecticut, New York, Maine and Norway.	Ground up for use in pottery making. The location of manufacturing centers of pottery of all kinds and of bricks is dependent on clay deposits. In pottery making, Ohio, New Jersey and Pennsylvania lead the United States. Abroad, fine china is made in France, Germany and China. All of these countries export chinaware.

## MINERAL PRODUCTS—Continued.

METALS	USES AND CHIEF PRODUCTS	LOCALITY AND PREPARATION	MANUFACTURE, USES AND TRADE
<b>Tin</b> is less abundant than most of the common metals. Fr., <i>Etain</i> ; Ger., <i>Zinn</i> ; Sp., <i>Estao</i> .	<i>Cassiterite</i> (tin oxide) is the only important ore. This mineral is commonly found as pebbles (stream tin) in gravel. <i>Stannite</i> and alloys containing tin are of enormous importance in the arts. Of these, <i>bronze</i> is chief. <i>Gun metal</i> , <i>printer's metal</i> , <i>type metal</i> and <i>brass</i> are other alloys. <i>Snails</i> of tin are used in dyeing, glass making, etc. <i>Stibnite</i> (antimony sulphide) is the chief ore of antimony. <i>Bismuth</i> occurs in small amounts in a pure state and also combined with sulphur. These metals form many alloys such as <i>type metal</i> , <i>anti-friction metals</i> , <i>white metal</i> , <i>babbit metal</i> , <i>fusible metals</i> , etc. <i>Tartar emetic</i> and other antimony compounds are used in medicine and dyeing. <i>Garnierite</i> (a silicate of nickel and magnesium) is the common ore. <i>Magnetic iron pyrite</i> ( <i>pyrrhotite</i> ) often carries several per cent of nickel. <i>Sulphides</i> and other compounds occur. <i>German silver</i> contains nickel, copper and zinc. It enters into other alloys.	The Malay peninsula and nearby islands (Borneo and Biliton) produce over half the tin ore of the world. The remainder is mined in Bolivia, Australia, Tasmania and Cornwall, England. Small deposits occur in the United States. Tin melts at a low temperature and is easily refined.  Antimony is produced in Germany, France, Italy, Hungary, United States, Japan, and other countries.  Bismuth comes mainly from Bolivia and Germany. Some is produced in Saxony and England.  In Ontario, Canada, nickel is found in <i>pyrrhotite</i> . <i>Garnierite</i> is mined in largest amount in New Caledonia. Norway produces other ores.	England manufactures more tin than any other country. <i>Stannite</i> , used for tin cans, roofing and kitchen utensils, is made by dipping sheet iron or steel in a bath of molten tin, then covering it with a thin layer of tin. <i>Stannite</i> is manufactured in the United States and imported from England. Tin metal is imported from England and Straits Settlements.  While the total amounts of these metals in use are relatively small, they are of high importance due to their peculiar properties. Our imports of antimony are mainly in the form of regulus or metal.  France and Germany refine nickel from imported ore, chiefly from New Caledonia. <i>Nickel</i> , especially hard and tough, is used for armor plate, special machinery and wire rope. <i>Nickel</i> is extensively used for cheap electroplating. <i>Nickel</i> and <i>nickel oxide</i> are exported to Holland and England from the United States and ores and matte are imported from Canada.
<b>Antimony</b> .—Fr., <i>Antimoine</i> ; Ger., <i>Antimon</i> ; Sp., <i>Antimonio</i> . <b>Bismuth</b> .—Fr., Ger. and Sp., <i>Bismuth</i> .			
<b>Nickel</b> .—Fr. and Ger., <i>Nickel</i> ; Ger., <i>Nickel</i> ; Sp., <i>Niquel</i> . <b>Cobalt</b> is found with nickel and forms pigments. Fr., <i>Cobalt</i> ; Ger., <i>Kobalt</i> ; Sp., <i>Cobalto</i> .			

## THE FOLLOWING METALS ARE LITTLE USED IN THE PURE STATE, BUT ENTER INTO THE COMPOSITION OF MANY USEFUL MINERALS

METALS	USES AND CHIEF PRODUCTS	LOCALITY AND PREPARATION	MANUFACTURE, USES AND TRADE
<b>Magnesium</b> .—Fr., <i>Magnésium</i> ; Ger., <i>Magnesium</i> ; Sp., <i>Magnesio</i> .	The metal is used in flash powders for photographic use. <i>Magnesia</i> (magnesium carbonate) is used in making earthen dishes and <i>epsons</i> salts and for preparing <i>magnesia</i> (calcined magnesia). <i>Dolomite</i> (magnesium calcium carbonate) is common limestone, used for building. <i>Talc</i> (hydrated magnesium silicate), <i>scapolite</i> or <i>scapolite</i> , is a soft mineral. <i>Merschaum</i> or <i>aspidolite</i> (magnesium silicate).	Chiefly mined in Austria, Germany and Greece.  Found in many parts of the world.  Mined in Maryland, Virginia, North Carolina, etc., and in Europe.  From Asia Minor and New Mexico.	Used in chemical manufacture, in fireproofing and lining furnaces. Imported into the United States.  Calcined dolomite is used for lining iron furnaces.  Made into laundry tubs, firebrick, hearthstones, griddles, slate and tailor's pencils, gas tips, etc. Imported in small amount from France and Italy. Easily carved. Made into pipes and cigar holders in Austria and France. Largely limited.
<b>Calcium</b> (Fr., <i>Calcium</i> ; Ger., <i>Calcium</i> ; Sp., <i>Calcio</i> ) has no commercial use in the metallic state. Its compounds, both natural and artificial, are of great economic importance.	<i>Asbestos</i> is a fibrous variety of serpentine (a magnesium silicate). <i>Mined</i> used is an artificial fibrous mineral. <i>Limestone</i> (calcium carbonate) is a very common rock used for building. It may be of almost any color and coarse or fine in texture. <i>Marble</i> is a name applied to limestones suitable for polishing or ornamental work. <i>Marble</i> is in translucent. <i>Chalk</i> is of peculiar soft texture; <i>whiting</i> is prepared chalk used to make pottery and paint; <i>precipitated chalk</i> is similar. <i>Lime</i> is made by burning (calcining) common limestone. <i>Fattened</i> and <i>hydraulic cements</i> are prepared by calcining siliceous limestones or a mixture of limestone and clay. <i>Chloride of lime</i> (or bleaching powder), <i>acetate of lime</i> , <i>calcium carbide</i> and many other compounds are of industrial value. <i>Gypsum</i> (hydrated calcium sulphate) is used in fertilizers (land plaster). <i>Plaster</i> is prepared by calcining (burning) gypsum. <i>Plaster of Paris</i> is its purest form. <i>Alabaster</i> is compact white gypsum. <i>Fluorite</i> (calcium fluoride) is a less common mineral. <i>Phosphate rock</i> (chiefly calcium phosphate, is important in the preparation of fertilizers and chemicals containing phosphorus.	Mined in Quebec, Canada. Another variety of asbestos comes from Italy. Mines recently discovered in Wyoming.  Limestones are found and utilized in all parts of the world. In the United States, Pennsylvania, Illinois, Ohio, Indiana, New York and Missouri are the chief producers. Fine marbles are quarried in Italy, Egypt, France, Spain and Greece. Vermont, Georgia, Tennessee and New York supply the greater part of the marble used in the United States. <i>Hydraulic cement</i> and <i>cements</i> are of enormous commercial importance, being used in concrete construction work. Europe and the United States produce large quantities. Pennsylvania is the leading state in this industry.  A common mineral mined in many parts of the world. Michigan, Kansas, New York, Ohio and other states produce it.  Mined in England, Kentucky and Illinois.  Found in deposits of organic origin in South Carolina, Florida, Tennessee, the West Indies, Canada, Spain, France, Germany and England.  Germany, England, Canada the United States and Spain produce the ores. Chemical laboratories transform them into the useful compounds.	Made into laundry tubs, firebrick, hearthstones, griddles, slate and tailor's pencils, gas tips, etc. Imported in small amount from France and Italy. Easily carved. Made into pipes and cigar holders in Austria and France. Largely limited.  A fireproofing material. This mineral fiber is spun and woven into fireproof fabrics for theater curtains or made into felt building paper, pipe covering, etc. As building material, limestone is used everywhere. Lime is used in chemical industries and mortar.  Handsome marbles are imported from Carrara, Italy, and other parts of Europe. Mexican onyx is also imported. Chalk comes mainly from the south of England. We export some Portland cement and import a little from Europe.  Buildings (both shops and residences) are constructed of this material. <i>Plaster of Paris</i> is used for casts, decorative plaster work, cement, etc.  Used in chemical manufacture and as a flux for ores. The natural phosphates are treated with sulphuric acid as a first step in the manufacture of phosphate fertilizers. Exported in large amount to Germany, England and other countries.  Sheep dip, rat poison, insecticides, emulsifying fluid, pigments and dyes are prepared with arsenic compounds. Arsenic salts are used in preparing certain coal-tar colors.
<b>Arsenic</b> .—Fr., <i>Arsenic</i> ; Ger., <i>Arsenik</i> ; Sp., <i>Arsénico</i> .	<i>Arsenopyrite</i> (arsenic and iron sulphide), <i>arsenite</i> and <i>realgar</i> (sulphides of arsenic) are the sources of arsenic. <i>Arsenic</i> (white arsenic, arsenious acid or oxide of arsenic), <i>arsenic green</i> and other compounds and salts are prepared.		

## METALS—Continued

METALS	ORES AND CHIEF PRODUCTS	LOCALITY AND PREPARATION	MANUFACTURE, USES AND TRADE
<b>Chrom.</b> —Fr. and Ger., <i>Chrome</i> ; Sp., <i>Cromo</i> .	<i>Chromite</i> (oxide of chromium and iron) is the only ore. <i>Bichromate of potash</i> is the most important compound.	Mined in Asia Minor, Greece, Canada, New Caledonia, California, etc. Salts are prepared in the chemical laboratory.	Bichromate of potash and chromic acid are used in tanning soft leather. A small percentage added to steel makes it very hard and suitable for burglar-proof safes, tools, etc. Salts of chrome are used for dyes and pigments (chrome yellow, chrome green).
<b>Barium.</b> —Fr., <i>Baryte</i> ; Ger., <i>Barium</i> , <i>Baryt</i> ; Sp., <i>Bario</i> .	<i>Barytes</i> or barite is a heavy white mineral (barium sulphate).	Mined in the United States and Germany.	A substitute for adulterant for white lead in paints and used in making oxygen.
<b>Strontium.</b> —Fr. and Ger., <i>Strontium</i> ; Sp., <i>Estroncio</i> .	<i>Strontianite</i> (strontium carbonate) and <i>celestite</i> (strontium sulphate) contain this element.	Found in Germany, Scotland, Texas and New York.	Strontium salts are used in sugar refining and making red fire.
<b>Potash</b> (or potassium), an alkaline metal. Fr. <i>Potasse</i> ; Ger., <i>Kalium</i> ; Sp., <i>Potasio</i> .	Chlorides, sulphates, etc., are found in Germany. Wood ashes and sugar beet refuse furnish much of the world's potash.	Stassfurt, Germany, possesses the only known large deposit of natural potash salts.	These salts are the source of potash in many chemical industries and in fertilizers. Exported in large amount from Germany to England, France and America.
<b>Sodium</b> (Fr., <i>Sodium</i> ; Ger., <i>Natrium</i> ; Sp., <i>Sodio</i> ) is the most important alkaline metal.	Salt (rock salt, sea salt, lake salt, halite or sodium chloride) is the commonest natural compound of sodium. Important for food and in chemical manufacture.	Rock salt is mined in Germany, Austria, Spain, England, Louisiana, Kansas, India and other parts of the world. Obtained by evaporating salt water from wells in England, Michigan, New York, Ohio and China, or by evaporating salt water in the West Indies, Great Salt Lake, etc.	Used for meat packing, curing fish, in silver plating, and the preparation of hydrochloric acid, soda ash, carbonate of soda, etc. The foreign trade in salt does not represent very large values.
	<i>Soda niter</i> (nitrate of sodium) is a very easily soluble mineral.	Found in quantity only in the deserts of northern Chili.	Exported in large amounts to Europe and America for fertilizer and the manufacture of nitric acid and other chemicals.
	<i>Borax</i> (hydrous sodium borate) occurs in nature in an impure form and is prepared also from calcium borates.	Borates are found in Tuscany, Central Asia, California and Nevada, and in South America.	Borax and boracic acid are used in pottery manufacture, for the preservation of meat, in dyeing and in medicine.
<b>Rare Metals.</b> —Tungsten, molybdenum; vanadium, uranium, thorium, cerium, lanthanum and yttrium.	The ores of these metals are unusual minerals.	Found in Colorado, Arizona, Germany, England and Sweden.	Used in making special high grades of steel. Their salts are used in dyeing.
	Monazite, samarskite, thorite and other rare minerals contain these elements.	Found in North Carolina, Norway, Brazil and Ceylon.	Used in preparing the mantles for incandescent gas lights.
Lithium.	Lithium silicates are the source of this element.	Principally from South Dakota, California and Sweden.	In chemical laboratories converted into lithium carbonate for medicinal tablets and mineral waters.
Radium.	Occurs with ores of uranium.	A newly discovered very rare element.	The chloride has peculiar properties and is used chiefly by physicians.

## NONMETALLIC MINERALS

MINERAL	ORES AND CHIEF PRODUCTS	LOCALITY AND PREPARATION	MANUFACTURE, USES AND TRADE
<b>Sulphur.</b> —Fr. <i>Soufre</i> ; Ger., <i>Schwefel</i> ; Sp., <i>Azufre</i> .	<i>Sulphur</i> or <i>brimstone</i> is found in a pure state in volcanic regions or associated with gypsum and limestone. <i>Pyrite</i> (sulphide of iron) is also a source of sulphur compounds.	Sicily, Italy, Japan, Louisiana and Utah have mines of native sulphur.	Used in manufacturing sulphuric acid, gunpowder, matches, as a disinfectant, for bleaching and vulcanizing rubber. Blue vitriol, green vitriol and alum are sulphates. Sulphur is imported from Sicily and Italy.
<b>Quartz</b> (silica) is of many varieties, crystalline to amorphous. Fr., <i>Quartz</i> ; Ger., <i>Quarz</i> ; Sp., <i>Cuarzo</i> .	<i>Rock crystal</i> is employed for lenses. Many semiprecious stones are varieties of quartz, as <i>agate</i> , <i>moose agate</i> , <i>onyx</i> , <i>sard</i> , <i>chalcodendrite</i> , <i>chrysoprase</i> , <i>jasper</i> , etc. <i>Rock flint</i> , <i>flint</i> and <i>quartz sand</i> are used in making glass and pottery. <i>Sandstones</i> of various colors are chiefly quartz.	Rock flint is mined in Connecticut and Pennsylvania. Flint comes from the chalk cliffs of England and France. Sandstones are quarried and used for building in almost all parts of the world. Pennsylvania, Ohio, and New York supply the greatest quantities in the United States. <i>Hornstones</i> and <i>whetstones</i> are mostly sandstone, and in this country are largely quarried in Arkansas, Michigan and New Hampshire.	Outside of building stones, quartz is used in greatest amount in making glass and pottery. For glass it is melted with alkali (soda ash) and either lime or lead oxide. Glass is either blown or molded. Belgium, Austria, Germany, France, Great Britain and the United States manufacture glassware. Pennsylvania, Indiana and New Jersey are the leading states. Large amounts are imported by England and the United States.
<b>Gems</b> of many kinds are found in nature. Fr., <i>Pierres précieuses</i> ; Ger., <i>Edelsteine</i> ; Sp., <i>Piedras preciosas</i> .	These are nearly all transparent stones having brilliancy or beauty of color. Aside from diamond, emerald and varieties of quartz, the following are important— <i>topaz</i> , <i>emerald</i> , <i>apuanmarine</i> , <i>tourmaline</i> , <i>zircon</i> , <i>sphene</i> , <i>moonstone</i> , <i>opal</i> , <i>turquoise</i> and <i>garnet</i> .	Produced in many parts of the world. Siberia, Russia, Ceylon, India, Brazil, North Carolina and Montana are all important.	Cut and polished for use in jewelry. Much of this work is done abroad.
<b>Mica</b> is a common mineral found in rocks in many parts of the world. Fr., <i>Mica</i> ; Ger., <i>Marienglas</i> , <i>Glimmer</i> ; Sp., <i>Espicjuelo</i> .	Several varieties occur ( <i>muscovite</i> , <i>biotite</i> , etc.) Valuable only when found in large sheets which can be split smoothly.	Mined in India, Canada, North Carolina and South Dakota.	Transparent sheets are used for lamp chimneys and stove doors. Employed in electrical work, and lubricating. Imported from India.
<b>Building Stones.</b> —Fr., <i>Pierres de construction</i> ; Ger., <i>Bausteine</i> ; Sp., <i>Piedras de construcción</i> .	<i>Granite</i> , <i>gneiss</i> , <i>marble</i> , <i>basalt</i> and other hard or durable rocks.	Quarried for local use in all parts of the world.	Only stone of exceptional beauty is shipped to a great distance. Scotland, Norway, Massachusetts, Maine and other localities produce fine stones.

## CARBON AND CARBON COMPOUNDS

MINERAL	FORMS AND CHIEF PRODUCTS	LOCALITY AND PREPARATION	MANUFACTURE, USES AND TRADE
<b>Coal</b> is the most important fuel. <i>Fr., Charbon de terre, houille; Ger., Kohle, Steinkohle; Sp., Carbon mineral.</i>	<i>Peat, lignite and brown coal are poor in quality, retaining much appearance of vegetable origin. Bituminous coal, coking coal, non-coking coal, anthracite coal, cherry coal, splint coal, gas coal, steam coal, etc., are all varieties of soft coal and contain a considerable percentage of volatile matter. A suberose coal is almost pure carbon.</i> By distillation, bituminous coal yields gas, ammonia, coal tar and coke. Coal tar products are numbered by the thousand. Among them are naphtha, benzene, oil of turpentine, perfume, flaxene, drugs, saccharine, aniline and other dyes, phenol, carbolic acid, naphthalic acid, naphthalene, photographic developers, cresolite, oil tar and pitch.	Coal is a result of the alteration of vegetable matter. Deposits occur in almost all parts of the world, but many are almost entirely undeveloped; as, for example, the coal fields of China. The largest production is in the United States, Wales, England, Germany, Austria, Russia and Australia. Mines are worked in India, Japan, Borneo and the Philippines. Pennsylvania, Ohio, West Virginia, Alabama, Indiana, Iowa and many other states mine coal in great amount. Pennsylvania produces nearly all of the anthracite and a large quantity of bituminous coal.	Bituminous coal is the fuel which runs the factories, railways and steamships of the world. The distillation of coal tar and the utilization of its numerous by-products, is one of the best examples of modern economy which turns waste material into useful products at large profits. Much coke is made without any by-product. The United States exports coal, both bituminous and anthracite to Canada and ships bituminous coal to Mexico, Cuba and other countries. Some coal is imported from British America. Great Britain has a large export trade in coal. Much of that shipped from Cardiff, Wales, is in the form of briquettes or blocks made by mixing small coal with pitch or tar and pressing it into shape.
<b>Petroleum</b> (or coal oil).— <i>Fr., Pétrole; Ger., Petroleum, Bergöl; Sp., Petróleo.</i>	Petroleum or coal oil, in its crude state, is a dark colored liquid. It yields by distillation, first, light oils, gasoline, naphtha, benzene; second, illuminating oil, kerosene, kerosene oil, etc.; third, lubricating oils, engine oil, cylinder oil, machine oil; fourth, petroleum residuum (for asphalt paving) and coke. Petroleum, naphtha and paraffin wax are by-products in petroleum refining.	Obtained from wells in the United States, Russia, Dutch East India, Galicia, Rumania and other countries. More than half of the world's output is from the United States, the leading districts being (1) Kansas and Oklahoma, (2) California (3) Illinois, (4) Pennsylvania and (5) Texas. Crude oil is transported from the wells for hundreds of miles through pipe lines to the refineries.	Probably no modern industry is more effectively organized and carried on than the petroleum business. There is no waste in the distillation of the crude oil and no part of it for which uses have not been found. In addition, the business of selling the oil is managed with the highest skill. American kerosene oil is exported to all parts of the globe. Crude oil is sold as well as other petroleum products.
<b>Asphaltum</b> (or mineral pitch).— <i>Fr., Asphalte, Goudron minéral; Ger., Asphalt; Sp., Asfalto.</i>	A bituminous mineral substance found more or less pure, in some localities. Rock asphalt consists of sandstone or limestone impregnated with asphalt. Much asphalt is produced in refining certain grades of petroleum—such as those obtained in California and Texas.	The pitch lake of Trinidad and the Bermudez lake at the mouth of the Orinoco in Venezuela, are the largest known deposits of moderately pure asphalt. Smaller deposits of high grade occur in Utah, Cuba and the Barbadoes. Rock asphalts are mined in France, Switzerland, Sicily, California, Kentucky and Oklahoma.	For paving, rock asphalts are much used in Europe. Trinidad and Venezuelan asphalt are exported in large quantities to the United States and Europe. For paving, these lake asphalts are mixed with broken stones, sand and petroleum residuum. Pure varieties (gilsonite, marjak, glance pitch) are made into black varnish, used for insulating, etc.
<b>Graphite</b> is almost pure carbon. <i>Fr., Graphite; Ger., Graphit; Sp., Gráfico.</i>	Plumbago or black lead is used in making erasables, lead pencils, lubricants for heavy machinery, stove polish, foundry facings, paint, etc. Artificial graphite is made from coal or coke by an electric process.	Produced in Bohemia, Ceylon, Italy, Germany, Mexico and the United States. The deposits in Ceylon are the largest in the world. Much of that mined in New York and Alabama is of very high grade.	Powdered graphite is mixed with fine clay in greater or less proportion and then molded and baked to form such articles as pencils and lead for pencils. Graphite is imported from Ceylon to the United States, and lead pencils from Europe.
<b>Diamond</b> is pure crystallized carbon. The hardest known substance. <i>Fr., Diamant; Ger., Diamant; Sp., Diamante.</i>	Many diamonds are transparent, colorless stones. Some are blue or yellow. Some stones (soft and uncolored) are used for gems but valuable for polishing or in diamond drills.	South Africa produces the bulk of the world's supply. These deposits are in rock. In Brazil and India a few diamonds are found in gravel. Most of those from Brazil are opaque and dark colored (carbonado).	The beauty of a diamond is largely due to cutting. The diamond cutting industry is centered in Amsterdam and Antwerp. Diamonds are imported to the United States mainly from Holland and Belgium after cutting. Carbonado is used in diamond drills. Diamonds are used in cutting glass and for grinding and polishing.
<b>Amber</b> is a fossil resin. <i>Fr., Ambre; Ger., Bernstein; Sp., Ambar.</i>		Found chiefly along the shores of the Baltic.	Used in making mouthpieces for pipes, cigar holders, beads, etc.
<b>Carborundum.</b>	Carbide of silicon. Harder than any known substance but the diamond.	Manufactured at Niagara Falls, by electrically heating a mixture of coke, sand and salt.	Used for making polishing powder, in grinding wheels, sharpening stones, abrasive cloth, etc.

**MONEY, BANKING AND FINANCE.**

Money comprises all things which every one accepts in exchange for his property and services and in exchange for which one can always procure the property and services of others which are on the market for sale. It includes coins made of gold, silver and copper, notes issued by banks, and, in the United States and some other countries, certain government notes.

**Functions of Money** may be described by the phrases *standard of value* and *medium of exchange*. By the former is meant that commodity in terms of which the value, or ratios of exchange, of commodities are measured and expressed. Gold is that commodity in the chief commercial countries of the world at the present time, and a certain definite portion of it, in the United States 23.22 grains, is declared by statute to be the unit of value and is given a special name, as the dollar, pound sterling, mark, franc, etc. By the medium of exchange is meant those things which *mediate*, or act as go-betweens, in exchanges. It includes coins made of the

standard commodity, all other things included under the head money, and many things not ordinarily so included, such as bank deposits, some other book accounts, various devices for making payments used by express companies and post offices, private tokens, etc.

**The Elements of the Medium of Exchange** common to the leading countries at the present time may be classified as *standard coins*, *subsidiary coins* and *bank currency*. In some countries are also found certain special coins not classifiable either as standard or subsidiary, and certain government notes.

**Standard Coins** are those made from the commodity which serves as the standard of value, are minted freely or at a small charge for whoever brings metal of the proper standard to the mints, and are legal tender for all payments public and private.

**Subsidiary Coins** are usually made of silver with an intrinsic value below their face value, are redeemable in standard coins, are legal tender only for small amounts, and are minted in limited quantities on gov-

ernment account. Among special coins may be mentioned the United States silver dollar, the five-franc piece of France, Belgium, Switzerland and Italy, and the thaler of Germany. These are coins which possess full legal tender power in their respective countries, and are not directly redeemable in standard coins, but are either longer coined at all or only coined from time to time in limited quantities under the authority of special laws.

**The Government Notes** referred to are usually noninterest-bearing promissory notes issued by governments in various denominations suitable for monetary purposes, and payable to bearer on demand. In the early stages of their history they are frequently not redeemable on demand in standard coins, and consequently depreciate in various degrees according to the likelihood of their redemption in a long or a short period, the fiscal condition of the government issuing them, and other circumstances.

**United States Money.**—The medium of exchange of the United States at the present



time, exclusive of its bank currency, consists of gold coins, silver dollars, silver half and quarter dollars and dimes, a nickel five-cent piece, a copper cent, gold certificates, silver certificates, greenbacks and Sherman notes.

**Gold and Silver Certificates** are issued, the former chiefly in large, and the latter in small denominations, by the treasury department in exchange for gold coins and silver dollars respectively, which are held for their redemption.

**Greenbacks**, also called **United States notes**, were first issued in 1862 and 1863 to assist in financing the Civil war. Until January

1, 1879, they were not redeemable in coin and were consequently depreciated. Since that time the Secretary of the Treasury has been obliged to redeem them in gold on demand, and for that purpose has kept on hand a gold reserve, which was fixed at \$150,000,000 by the act of 1900. When redeemed, they can only be reissued in exchange for gold coin, and the total amount which may be issued under existing laws is \$346,681,016.

The **Sherman Notes** were issued under authority of an act passed in 1890 providing for the purchase each month of 4,500,000 ounces of silver bullion at its market price,

to be paid for in treasury notes, which were to be redeemable on demand in gold coin or silver dollars at the option of the Secretary of the Treasury.

In 1893 the silver purchase clause of this act was repealed, about \$150,000,000 of the certificates having been issued to that time. The bullion accumulated in the vaults of the treasury under authority of this act was subsequently coined by authority of law, silver certificates issued, and, by authority given in the act of 1900, gradually substituted for the Sherman notes, less than \$4,000,000 of which still remain in circulation.

#### MONETARY SYSTEM OF THE UNITED STATES AS AT PRESENT CONSTITUTED I. Gold, Silver and Minor Coins

	GOLD COIN	STANDARD SILVER DOLLARS	SUBSIDIARY SILVER COIN	MINOR COIN
<b>Weight</b> .....	25.8 grains to the dollar.	412.6 grains.	355.5 grains to the dollar	5 cent piece: 77.16 grains, 75 per cent copper, 25 per cent nickel. 1 cent piece: 48 grains, 95 per cent, copper, 5 per cent tin and zinc. Nobles of the people. 5 cents, 1 cent. Not to exceed 25 cents.
<b>Finesness</b> .....	900-1000.	900-1000.	900-1000.	For all dues up to 25 cents.
<b>Ratio to gold</b> .....	Unlimited.	15.988 to 1.	14.953 to 1.	For all dues up to \$10.
<b>Limit of issue</b> .....	Unlimited.	Coins ceased in 1905.	Needs of the people.	For minor coin.
<b>Denominations</b> .....	\$20, \$10, \$5, \$2½.	Unlimited, unless otherwise contracted.	50 cents, 25 cents, 10 cents.	In lawful money at the treasury in sums or multiples of \$20.
<b>Legal tender</b> .....	Unlimited.	For all public dues.	For all dues up to \$10.	In lawful money at the treasury in sums or multiples of \$20.
<b>Acceptable</b> .....	For all public dues.	For silver certificates and minor coin.		
<b>Exchangeable</b> .....	For gold certificates, as below, and subsidiary and minor coin.			
<b>Redeemable</b> .....				

#### II. Paper Currency

	GOLD CERTIFICATES	SILVER CERTIFICATES	UNITED STATES NOTES	TREASURY NOTES OF 1890	NATIONAL BANK NOTES
<b>Limit of issue</b> .....	Unlimited for gold coin unless gold reserve falls below \$100,000,000.	Amount of silver dollars coined, \$562,172,530.	\$346,681,016.	No further issue; volume steadily diminishing by redemption in silver dollars.	Not to exceed capital of banks.
<b>Denominations</b> .....	\$10,000, \$5,000, \$1,000, \$500, \$100, \$50, \$20, \$10.	\$100, \$50, \$20, \$10, \$5, \$2, \$1.	\$1,000, \$500, \$100, \$50, \$20, \$10, \$5, \$2, \$1.	\$1,000, \$500, \$100, \$50, \$20, \$10, \$5, \$2, \$1.	\$1,000, \$500, \$100, \$50, \$20, \$10, \$5.
<b>Legal tender</b> .....	Not a tender.	Not a tender.	For all debts, public and private, except customs and interest on public debt.	Unlimited, unless otherwise contracted.	Not a tender.
<b>Acceptable</b> .....	For all public dues.	For all public dues.	For all public dues.	For all public dues.	For all public dues except customs.
<b>Exchangeable</b> .....	For subsidiary and minor coin.	For silver and minor coin.	For silver and minor coin.	For silver and minor coin.	For subsidiary silver and minor coin.
<b>Redeemable</b> .....	In gold coin at the treasury.	In silver dollars at the treasury.	In gold at the treasury.	In gold at the treasury.	In lawful money at the treasury, or at bank of issue.

#### COINAGE OF THE UNITED STATES, 1793-1910

DENOMINATION	PIECES	VALUES	DENOMINATION	PIECES	VALUES
<b>GOLD</b>					
<b>Double eagles</b> .....	112,807,169	\$2,256,143,380.00	<b>Half dimes</b> (coinage discontinued, act of Feb. 28, 1879).....	97,604,388	\$4,880,219.40
<b>Eagles</b> .....	17,203,022	172,030,220.00	<b>Three-cent pieces</b> (coinage discontinued, act of Feb. 12, 1879).....	42,736,240	1,282,067.20
<b>Three-dollar pieces</b> (coinage discontinued under act of September 26, 1890).....	539,792	1,619,376.00	<b>Total silver</b> .....	2,110,677,005	\$963,408,087.95
<b>Quarter eagles</b> .....	13,971,659	34,929,147.50	<b>MINOR</b>		
<b>Dollars</b> (coinage discontinued under act of September 26, 1890).....	19,499,337	19,499,337.00	<b>Five-cent pieces, nickel</b> .....	642,501,287	\$32,125,064.35
<b>Dollars, Louisiana Purchase Exposition</b> (act of June 28, 1902).....	250,000	250,000.00	<b>Three-cent pieces, nickel</b> (coinage discontinued, act of September 26, 1890).....	31,378,316	941,349.48
<b>Dollars, Lewis &amp; Clark exposition</b> .....	60,000	60,000.00	<b>Two-cent pieces, bronze</b> (coinage discontinued, act of September 26, 1890).....	45,601,000	912,020.00
<b>Total gold</b> .....	266,291,942	\$3,149,207,675.50	<b>One-cent pieces, copper</b> (coinage discontinued, act of February 21, 1837).....	156,288,744	1,562,887.44
<b>SILVER</b>					
<b>Dollars</b> (coinage discontinued, act of Feb. 12, 1879, resumed act of Feb. 28, 1879).....	578,303,848	\$578,303,848.00	<b>One-cent pieces, nickel</b> (coinage discontinued, act of April 22, 1864).....	200,772,000	2,007,720.00
<b>Trade dollars</b> (discontinued, act of Feb. 19, 1857).....	35,965,924	35,965,924.00	<b>One-cent pieces, bronze</b> .....	1,850,536,529	18,505,365.29
<b>Half dollars</b> (Columbian souvenir, act of March 3, 1899).....	50,000	50,000.00	<b>Half-cent pieces, copper</b> (coinage discontinued, act of February 21, 1837).....	7,965,222	39,926.11
<b>Half dollars</b> .....	366,731,221	183,365,610.50	<b>Total minor</b> .....	2,944,063,096	\$56,154,332.67
<b>Half dollar</b> (Columbian souvenir).....	5,000,000	5,000,000.00	<b>Total coinage</b> .....	5,327,032,048	\$4,168,798,091.12
<b>Quarter dollars</b> .....	383,922,411	96,480,602.25	<b>Silver-dollar coinage under acts of April 2, 1792; \$4,031,235; February 28, 1878; \$378,166,793; July 14, 1890; \$187,027,345; March 3, 1891; \$5,078,472—total, \$578,303,848.</b>		
<b>Quarter dollars</b> (Columbian souvenir).....	40,000	10,000.00			
<b>Twenty-cent pieces</b> (coinage discontinued act of May 2, 1878).....	1,355,000	271,000.00			
<b>Dimes</b> .....	602,967,986	60,296,798.60			

The Medium of Exchange of Other Countries, exclusive of their bank currency, resembles that of the United States

in most essentials, but differs from it in some particulars. Canada.—That of Canada approximates it

most closely, the unit of value being the same, and government notes playing an important rôle. The gold coins of both

England and the United States, however, are there current, and the governor-general may declare other gold coins legal tender at their bullion value.

**England** has a large unit of value, consisting of 123.274 grains of standard and 113,001 grains of pure gold, which is represented in a coin called the *sovereign*. Its silver coins are all subsidiary, the shilling weighing 87.9 grains 0.925 fine, being the unit among them and having a tale value of one-twentieth of a sovereign. The penny and the farthing are minor coins of copper having tale values respectively of one-twelfth and one-fourty-eighth of a shilling.

Unlike the United States, England does not use government notes as an element of currency.

**France, Belgium, Switzerland, and Italy** have the so-called franc system, the franc, consisting of 4.978 grains of standard and 4.4872 grains of pure gold, being the unit. In these countries all the silver coins are subsidiary, except the five-franc piece, which in its status closely resembles the silver dollar of the United States. It contains 385.8 grains of standard and 347.22 grains of pure silver, and from 1865 to 1874 was coined in unlimited amounts for private persons at a seigniorage charge of one and two-thirds francs per kilogram. Between 1874 and 1878 they were coined in limited quantities for government account only, but since the latter date their coinage has been suspended. However, they still remain legal tender at their tale value for all amounts.

**Germany** makes the mark its unit, consisting of 6.1457 grains of standard gold. All silver coins are subsidiary except the thaler. The silver mark weighs 85.733 grains, and all subsidiary coins are legal tender only in payments of twenty marks or less. The thalers are remnants of the old currency systems in use before the foundation of the empire and are legal tender for any amount. Imperial treasury notes constitute a small element of the currency of the empire.

**Banks.**—The largest element of the medium of exchange of commercial nations is supplied by banks, which also frequently perform other important financial functions, such as the encouragement of saving, the purchase and sale of securities, the promotion of industrial enterprises and the execution of trusts of various kinds. Their most fundamental operations are the conduct of deposit accounts and the making of loans and discounts.

**Deposits** are credits on the books of a bank obtained by business men and others by the sale to the bank of their surplus cash, their own personal notes, and of credit instruments representing payments due them from other people. These credits give the customer the right to call upon the bank for legal tender money or for a transfer to the credit of some other person of all or some part of the amount due him. Some, known as *demand deposits*, give the right to demand payment at any time without notice, and others, known as *time deposits*, only after the lapse of a certain time from the date of demand.

**Check.**—In making use of his rights the customer employs the *check*, which is a written order to the bank to pay to bearer or to the order of a specified person a specified sum.

**Loans and Discounts.**—The personal notes and bills of exchange payable at some future date received by the bank in return for credits allowed or cash advanced are usually described in bank accounts as *loans* and *discounts*.

**Bank Notes.**—Instead of opening credit accounts or advancing legal tender money to its customers a bank having the authority may *issue notes*—that is, transfer to them its promises to pay to bearer on demand—in denominations convenient for use as money. To the bank these notes represent obligations of the same kind as deposits, but to the customer they serve as hand-to-hand money and may be substituted for government notes, and, for many purposes, for coin.

**Banking Processes.**—Through the processes involved in *loaning, discounting, conducting deposit accounts, and issuing notes*, banks perform a large part of the world's exchange. In the United States the major part. Nearly all business men and a large percentage of other people are their customers.

Purchases of goods are generally made on time, the credit instruments, such as personal notes and bills of exchange, which represent the obligations thus created, are discounted by the banks, and deposit accounts opened against them. By transfers of these from one person to another the mutual indebtedness created by purchases and sales on credit are canceled and the transactions thus completed and closed.

**Profits.**—The interest on the discounted notes and bills, which it has purchased by credit accounts bearing no interest or a lower interest, than is charged on loans or by notes, is the chief source of a bank's profits.

**Exchange.**—In the conduct of their business banks find themselves each day in the possession of checks, drafts and other bills of exchange drawn on other banks in the same or other cities.

**Clearing Houses.**—In order to collect those drawn on banks located in the same town or cities, banks have organized clearing houses in all large and in many small cities. These are places at which clerks of the various banks meet for the purpose of exchanging checks, drafts, etc., and settling mutual obligations.

**Correspondents.**—For the collection of paper drawn on out-of-town banks and the supply of their customers with the means of meeting out-of-town payments, banks usually employ what are known as *correspondents*. These are banks in commercial and financial centers with which they open deposit accounts on which they arrange to have credited the amounts of checks, drafts, etc., sent for collection, and debited the drafts drawn in favor of their customers. Through this correspondence system the banks of the entire commercial world have been organized into a great machine for the conduct of commerce, business men anywhere being able through their banker to make payments in any part of the world or to receive amounts due them.

Through it, also, the mutual indebtedness of the people of different cities, states and nations, created by mutual trade, investments, and other financial operations, are canceled in substantially the same manner as those between citizens of the same place are canceled by local banks and clearing houses.

**Bank Balances.**—The aggregate of the debits and credits which the banks of a place have with their correspondents represents a considerable degree of accuracy what the people of the place owe to outsiders and what outsiders owe to them. The balance between these aggregates may be great or small, in favor of the banks or against them, and their payment, if demanded, must be accomplished by the

shipment of money. If payment is not demanded the banks will ordinarily pay interest on adverse balances and receive interest on favorable ones. The banks are thus put to expense whenever the balance is against them and are making a profit whenever it is in their favor. In the first case, in order to indemnify themselves, they must charge a premium on drafts on out-of-town places, and in the second case they can afford to sell drafts at a discount, provided they can make more out of their funds at home than the interest allowed on their balances with correspondents.

**Rate of Exchange.**—This premium charged or discount allowed on drafts is known as the *rate of exchange*. If a premium is charged, *exchange is said to be at a premium*; if a discount is allowed, it is said to be at a discount.

The rate of exchange at a given time is fixed by a process of bargaining between either the banks of a place which have favorable balances with correspondents and therefore desire or are willing to sell exchange, and those which have unfavorable balances and consequently desire or are willing to buy exchange, or, in case all the banks are in the same situation as regards the condition of their balances, between the banks and those of their customers who want exchange.

**Foreign Exchange.**—In the foreign exchange, between countries having the same standard, the so-called *par of exchange* must be calculated; that is, the exact equivalent of the unit of one nation in terms of the other. Between the United States and other nations this calculation consists of dividing the number of grains of pure gold contained in the foreign unit by 23.22, the number of grains of pure gold in our dollar.

Between countries having different standards—for example, between gold and silver standard countries—the place of the par of exchange is taken by the relative market values of the two metals. If one or both of the nations have a secondary standard its depreciation must be calculated as well as the par of exchange or the relative values of the metals constituting their primary standards.

The rates of exchange between foreign countries fluctuate above or below the par of exchange or the substitute for it as the domestic rate fluctuates above and below the par value of domestic drafts. Between gold standard countries the upper and lower limits of these fluctuations are determined by adding to and subtracting from the par of exchange the cost of obtaining and shipping gold, and are called the *gold points*.

**Foreign Drafts** are drawn by parties of various degrees of financial reputation and are made payable at different dates. Accordingly the element of interest enters into the calculation when he sells a *time-draft* draft he receives the pay for it at the date of sale and still draws interest on the total amount of his balance for sixty days, the draft not being payable until after the lapse of that period of time.

When a New York banker sells a *cash* there is no appreciable interval between the time at which he receives the pay for it and the time at which his balance with his foreign correspondent is diminished by the amount drawn, when he sells a *time-draft* draft he receives the pay for it at the date of sale and still draws interest on the total amount of his balance for sixty days, the draft not being payable until after the lapse of that period of time.

Leaving out of consideration, therefore, the cost of the cablegram, he could afford to

sell a sixty-day draft at the price of a cable minus interest on the amount for sixty days at the rate received on balances with his correspondent.

**Classes of Banks.**—From the standpoint of the source of their authority to do business, banks in the United States may be classified as *national, state and private* according as they are chartered by Congress or by state legislatures or operate without charters under the authority of the common law.

State banks may be subclassified into *commercial banks, savings banks and trust companies.*

The basis of this classification is the nature of the business performed.

**Commercial Banks** perform the functions described and cater to the needs of the commercial classes.

**Savings Banks** specialize in the business of promoting saving by keeping time deposits, upon which they allow relatively liberal rates of interest, and by investing them in high-class securities, like bonds and real estate mortgages, instead of commercial loans of the kind chiefly sought by commercial banks.

**Trust Companies** were originally organized for the purpose of administering financial trusts of all kinds, such as the estates of deceased persons, or of living persons who are unable or unwilling to administer them for themselves, and those of charitable, educational and other institutions. They have added to these, however, numerous other functions, such as acting as financial agents for corporations, states, municipalities, and at times even the federal government; promoting and financing new enterprises, especially combinations, mergers and trusts; stock jobbing; the promotion of saving; and, when not forbidden by law, commercial banking.

In fact the tendency of their development is in the direction of making them financial department stores in which every branch of finance is carried on.

**Banking Laws.**—The laws governing the different classes of institutions are not uniform throughout the United States, although there is a tendency toward uniformity observable in recent legislation.

**The National Banks** are regulated by the federal banking code, which among other provisions confers the right to issue notes on the security of government bonds deposited with the comptroller of the currency; prohibits loans on real estate security and holding of real estate except for certain carefully specified purposes; limits the amount that may be loaned to any single firm or person to 10 per cent of the bank's capital and surplus; and prescribes a minimum capitalization of \$25,000, and a reserve against deposits of 15 per cent in the case of country banks and of 25 per cent in the case of others.

**Touching Other Banks.**—The legislation of the various states regarding commercial banks is far from uniform, but the national banking code has served as a model in many cases. The chief differences between the rights and privileges of the two classes of institutions are the following:

(1) State banks do not issue notes chiefly because the national government levies a tax of 10 per cent on such notes and sometimes also because such issues are prohibited by law.

(2) In most states commercial banks with a capital stock as small as \$10,000 are permitted and in a few no minimum is prescribed.

(3) The laws of most states are more liberal than the national banking code in the matter of real estate loans and in that of the amount permitted to be loaned to a single firm or individual.

The laws regarding savings banks differ somewhat according as the institution belongs to the *mutual or the stock* class, but usually limit their investments to certain specified classes of securities, limit the amount of deposits in the name of a single individual, and permit the bank to require a certain number of days' notice of the depositor's intention to withdraw deposits.

Legislation regarding trust companies is changing rapidly. The tendency in some states now is to require them to segregate the different branches of their business and to conform to the laws regulating institutions which specialize in each branch; for example, to the laws regarding commercial banks in the management of their strictly commercial business, to those regarding savings banks in their savings business, etc.

**European Banking Systems** differ from ours chiefly in the presence in each country of a central bank in such relations to the government and the other banking institutions as to make it the center and balance wheel of the entire system.

In England this central institution is the Bank of England, in France the Bank of France, and in Germany the Imperial Bank. The most important other commercial banking institutions of these countries fall into groups somewhat different from those in the United States.

In England they are the *joint-stock and private banks, foreign and colonial banks and discount firms and companies.*

In France, five great incorporated institutions which do the bulk of the business; *private banks, provincial banks, and foreign and colonial banks.*

In Germany, eight large incorporated banks, *private banks, provincial banks, mortgage and cooperative banks.* In all of these countries these banks operate extensively through branches.

**Postal Savings Banks.**—In most European countries are also found postal savings banks conducted by the post-office departments of their respective governments, and in many of them so-called mortgage banks for loaning on real estate security and cooperative banks for loaning to peasants, artisans and others on the joint security of their combined properties.

**The Financial Center** of each country, which is usually also its chief commercial center, is the seat of its chief money market. By this is meant the place where the machinery for the keeping and distribution of the money funds of the country, for the determination and registration of loan rates, for the investment of a large portion of its capital, and for the sale and registration of its principal securities, is located. The central money market of this country is in New York City; that of England is in London, and those of France and Germany in Paris and Berlin respectively.

**Machinery of the Money Market.**—The most important parts of the machinery of the New York money market are the *banks, state and national, organized into the clearing house association, groups of trust companies, private banks and foreign banks, the United States subtreasury and assay office, and the stock exchange.*

**The Associated Banks** act as reserve agents and correspondents for banks and trust companies in every part of the country,

and in this capacity hold balances to the credit of these institutions which aggregate very large sums.

**The New York Subtreasury** receives and disburses a very large percentage of the revenues of the federal government, and thus at times draws heavily on the funds on deposit in the associated banks and at others pours large amounts into their coffers.

**The Assay Office** is the principal avenue through which new supplies of the precious metals reach the market.

**The Trust Companies** serve as financial agents for the great railroads, trusts and other corporations of national scope and influence and also do a large commercial banking business.

**The Foreign Banks** mediate between foreign financial centers and New York.

**The New York Stock Exchange** lists the bonds and stocks of great railroads, public service corporations, trusts and other industrial corporations of national scope, the bonds of the United States government, and occasionally those of foreign countries, of states and municipalities, and the stock of banks and trust companies. It furnishes a carefully regulated market for the daily purchase and sale of these securities and also a place for the loaning of such funds as bankers and other parties wish to place at the disposal of stock brokers, speculators and investors.

The private banks and brokerage firms mediate between the investors of the country, the stock exchange and the banks.

**The Cash Reserves** of the associated banks thus constitute the central money reservoir of the country. From it are drawn a considerable portion of the funds needed by banks in every part of the country for the accommodation of their customers and to it ultimately flows their surplus cash. From it also the United States government draws most of its supplies and to it contributes from time to time its surpluses.

**The Financial Barometer.**—The amount of these reserves in excess of 25 per cent of their deposits, the minimum amount required by law to be kept constantly on hand in their vaults, called the *surplus reserves*, is an excellent barometer of the power of the New York banks to lend, and is, therefore, constantly watched by persons and institutions whose operations are based on loans obtained in the New York market.

The rates charged for loans are also affected by the fluctuations of these reserves, usually rising when they fall and vice versa. When the surplus reserves fall to a low point or entirely vanish, as a result of drafts on the New York banks from various parts of this country, from foreign countries, from the subtreasury, or from all three combined, the money rates accordingly rise to very high points, and operators on the stock exchange, being deprived of funds for further operations and being called upon to pay their loans, are forced to sell the securities lodged as collateral at such prices as they will bring.

**Panics.**—At such times the values of securities fall, and sometimes, when this movement goes to extremes, a panic ensues. If the efforts thus to raise funds to meet obligations to the banks wholly or to a considerable degree fail, bank failures at commercial centers result, followed by a rapidly widening circle of banking and commercial failures throughout the country. In other words a commercial crisis follows. The originating cause or causes of the crisis may be outside of and possibly widely

distant from New York, but it is quite certain to follow the course indicated on account of the vital connection of the New York market with the rest of the country.

**The European Central Banks.**—In Europe the central banks play a leading rôle in the money markets. They hold the reserves of the other banks, rediscount bills for them in case of need, act as bankers for their respective governments, issue most or all of the notes, and exercise a controlling influence over rates.

**Importance of Gold.**—Their ability to perform these functions depends primarily upon their power to influence the international flow of the precious metals, especially gold, and to issue notes against commercial bills. When, for example, the reserve of the Bank of England falls below a certain point, on account of drafts made upon it by other institutions, it raises the rate of discount.

This normally causes the market rate to rise, since the interest rate on deposits paid by other banks and financial institutions varies with the rate of discount.

rate and they must charge higher rates in order to reimburse themselves.

The rise in the market rate attracts funds from the continent or checks an outward flow and this increases the bank's reserve or prevents a further decline. The increased bank rate also acts as a check on borrowers and in this way also contributes toward the protection of the reserves.

**The Issue of Notes** against commercial securities by the Bank of France and other central institutions, having this right, contributes to the same end. When, for example, the demand for currency increases in France, larger drafts are made upon the Bank of France and these may be met in whole or in part by issues of notes instead of by payments of cash which would diminish the reserves. When the demand causes the surplus notes are deposited in the banks, returned by them to the central institution and canceled or preserved for issue at another time.

The same procedure is possible in Germany, though there, if the issues of the

Imperial Bank exceed a certain maximum, a tax of 5 per cent must be paid to the government on the excess.

The issues of the Bank of France are also limited by law to a certain maximum, but this is changed from time to time and is ordinarily maintained at so high a point as to leave the bank a large margin for increases in time of need.

**Advantages of Elastic Notes.**—In countries like these, in which the central banks have the right freely to issue notes against their general assets as well as to manipulate the exports and imports of gold through changes in their discount rates, the rates charged on loans both by the central and the other banks are more stable and fluctuate within narrower limits than in England, where the central bank lacks this special resource. The fluctuations are very much smaller both in number and in magnitude than in the United States, where, in the absence of a central bank, the means for manipulating exports and imports of gold are inadequate and the system of note issues quite as inelastic as that of England.

### BANKS IN THE UNITED STATES From Special Reports of the United States Comptroller of Currency

STATE OR TERRITORY	NATIONAL BANKS		STATE BANKS		SAVINGS BANKS		PRIVATE BANKS		LOAN AND TRUST COMPANIES		TOTAL	
	Banks	Savings Deposits	Banks	Savings Deposits	Banks	Savings Deposits	Banks	Savings Deposits	Companies	Savings Deposits	Banks	Depositors Savings Deposits
Alabama.....	72	\$3,398,159.67	99	\$2,314,790.14	7	\$1,800,082.96	9	\$236,915.59	.....	.....	187	20,725 \$7,810,548.36
Alaska.....	2	43,078.38	.....	601,953.58	.....	.....	.....	.....	.....	.....	8	229 545,032.02
Arizona.....	4	1,262,199.73	25	1,259,035.27	16	7,177,302.57	.....	.....	.....	.....	4	266 4,788 1,262,199.73
Arkansas.....	42	1,162,194.33	115	1,151,291.47	4	534,079.79	2	85,257.04	.....	.....	163	14,187 2,962,702.62
California.....	147	11,495,896.30	249	\$1,316,029.87	122	226,122,970.63	7	242,761.28	14	18,160,815.16	529	281,228 437,37.26
Colorado.....	14	10,719,215.25	9	6,584,376.91	.....	192,204.60	.....	.....	.....	4	47,971,694.13	228 20,219,894.54
Connecticut.....	183	855,948.79	.....	.....	58	255,811,170.99	.....	.....	19	3,051,660.93	199	453,901 299,717,580.78
Delaware.....	27	1,364,600.60	2	64,113.86	2	9,135,409.30	.....	.....	10	865,030.26	41	35,668 11,928,554.02
District of Columbia.....	11	321,106.65	.....	.....	12	11,295,973.38	.....	.....	5	7,275,506.95	28	87,711 15,922,588.86
Florida.....	37	5,551,119.47	63	1,078,622.67	4	955,036.78	6	84,043.32	.....	.....	110	28,590 8,572,792.04
Georgia.....	13	2,762,199.73	25	1,259,035.27	16	7,177,302.57	.....	.....	.....	.....	4	266 4,788 1,262,199.73
Hawaii.....	4	159,183.75	7	2,490,180.68	.....	.....	.....	.....	.....	.....	11	11,325 3,695,363.93
Idaho.....	41	824,839.68	.....	788,193.68	.....	129,794.52	.....	16,158.15	.....	.....	41	11,265 1,971,967.96
Illinois.....	401	44,444,384.96	264	12,429,087.07	2	10,875,910.43	30	162,831,391.28	.....	.....	481	1,191,194 55,874,585.55
Indiana.....	247	19,344,384.96	264	9,022,115.07	2	10,875,910.43	153	2,206,060.60	88	27,247,313.68	693	271,261 28,888,736.21
Iowa.....	501	10,668,815.84	264	10,789,929.99	47	115,019,699.02	111	4,256,772.49	4	645,355.25	1,092	419,645 153,973,063.88
Kansas.....	209	6,454,228.48	581	5,586,609.83	.....	2,846,341.24	.....	.....	.....	.....	61	228 15,936,642.64
Kentucky.....	138	7,910,563.44	282	9,326,496.94	9	1,080,460.59	.....	.....	25	3,020,175.81	454	506,594 21,573,542.63
Louisiana.....	39	2,181,764.62	116	6,344,169.74	8	12,450,459.35	.....	.....	35	10,370,527.36	159	80,743 21,573,542.63
Maine.....	79	13,992,658.41	.....	.....	61	87,409,640.73	.....	.....	.....	.....	140	119,779,073.31
Maryland.....	97	59,980,600.58	28	5,637,902.12	44	18,249,416.37	1	26,644.87	13	1,206,305.16	183	341,137 125,675,028.99
Massachusetts.....	107	11,520,824.86	.....	.....	127	48,407,465.04	.....	.....	45	7,128,738.38	427	9,019,137 64,910,028.13
Michigan.....	97	39,103,095.48	264	10,936,636.67	14	20,190,448.22	102	3,905,944.55	.....	.....	478	606,898 174,447,635.03
Minnesota.....	258	22,298,095.48	264	20,075,232.58	11	21,769,828.27	.....	.....	2	793,244.59	781	257,267 64,910,028.13
Mississippi.....	30	1,269,397.97	140	4,149,233.11	12	2,002,908.71	4	10,960.03	.....	.....	192	41,554 7,432,239.32
Missouri.....	118	9,419,095.48	748	17,309,410.35	.....	3,305,053.01	39	846,395.33	34	21,305,046.14	941	218,655 40,810,519.77
Montana.....	40	3,476,795.38	40	1,522,131.03	3	3,305,053.01	8	177,223.59	2	1,229,259.69	99	21,079 9,772,492.68
Nebraska.....	104	10,638,208.57	520	10,900,758.50	21	7,018,259.87	6	.....	.....	.....	731	67,671 24,177,200.95
Nevada.....	36	1,162,114.68	14	2,514,812.27	.....	.....	.....	.....	.....	.....	50	4,657 9,772,492.68
New Hampshire.....	36	1,710,750.41	8	4,653,877.99	61	77,933,456.92	7	398,213.34	70	72,917,470.11	119	197,757 84,909,715.22
New Jersey.....	147	31,202,470.27	.....	2,899,285.32	27	98,139,511.77	.....	.....	.....	.....	301	641,808 1,747,214.91
New Mexico.....	12	1,262,199.73	.....	.....	4	415,171.64	.....	.....	.....	.....	3	998 1,747,214.91
New York.....	428	87,407,465.04	108	34,812,378.99	137	1,405,239,951.59	2	807,320.49	80	66,964,224.91	841	2,236,894 1,747,214.91
North Carolina.....	61	5,282,127.12	.....	3,264,443.56	21	6,211,264.93	.....	2,309.50	4	1,299,734.16	81	1,299,734.16
North Dakota.....	14	1,262,199.73	.....	.....	.....	.....	.....	.....	.....	.....	14	1,262,199.73
Ohio.....	359	43,947,472.25	294	3,121,416.44	41	67,865,958.55	104	6,335,502.03	13	72,917,470.11	801	801,516 274,251,090.78
Oklahoma.....	201	1,660,438.70	287	1,382,734.84	.....	.....	.....	.....	.....	.....	488	3,043,173.54
Oregon.....	14	1,262,199.73	.....	9,412,981.81	.....	1,010,762.03	9	11,226.99	5	2,876,545.32	169	27,254 10,541,663.87
Pennsylvania.....	766	17,057,745.74	141	3,687,323.63	11	166,065,476.28	21	1,515,474.20	23	96,132,802.92	1,144	1,144,020 600,485,711.85
Porto Rico.....	.....	.....	.....	363,878.37	.....	.....	.....	.....	.....	.....	.....	.....
Rhode Island.....	22	3,634,820.72	.....	.....	18	69,298,119.42	.....	.....	10	43,517,464.16	52	122,413 116,670,308.30
South Carolina.....	31	5,740,801.20	115	4,625,878.79	22	8,302,198.19	5	283,627.13	.....	.....	173	66,553 11,750,512.25
South Dakota.....	8	2,181,764.62	.....	7,847,085.79	.....	3,792,502.08	14	280,673.1	.....	.....	22	1,262,199.73
Tennessee.....	84	6,584,376.91	269	2,729,903.62	21	11,111,244.81	.....	.....	.....	.....	125	8,643 2,927,315.55
Texas.....	469	6,179,892.08	243	414,222.49	.....	.....	.....	.....	22	11,229,14.17	770	34,484 9,157,901.75
Utah.....	20	1,262,199.73	.....	9,029,356.19	.....	5,940,412.18	.....	71,501.99	.....	.....	10	1,262,199.73
Vermont.....	4	2,514,812.27	.....	.....	29	39,471,118.52	.....	.....	23	18,878,326.25	91	178,582 65,894,090.08
Virginia.....	111	20,832,644.88	151	11,625,921.35	20	9,277,197.10	1	130,762.92	.....	1,249,161.21	288	126,807 45,115,686.54
Washington.....	72	10,719,215.25	.....	12,519,012.81	.....	3,792,502.08	.....	.....	16	4,012,713.74	178	1,262,199.73
West Virginia.....	16	8,628,094.21	.....	777,101.78	.....	5,652,371.82	.....	.....	10	1,196,884.05	190	91,626 23,444,441.87
Wisconsin.....	123	40,771,994.42	3	8,244,019.75	8	1,144,513.02	.....	.....	8	2,247,470.89	149	344,965 79,027,289.02
Wyoming.....	29	2,080,717.88	37	269,940.67	.....	.....	.....	.....	8	12,158.07	74	6,812 2,666,697.95
Total.....	6,027,757,000	152,350,000	2,067,997,021	44,881,540	633,492,072	45	993,424,992.86	80,267,097,411	15,245,144,804	696,678,738	738	579.65
By Divisions.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New England.....	381	41,264,786.07	105	4,655,577.85	415	1,238,150,733.66	.....	.....	130	88,049,917.07	1,049	3,304,482 1,892,171,014.99
Eastern.....	13,374,343,848	27,327,321,912.84	2,637,178,325,098	4,245,178,325,098	.....	.....	.....	.....	41	245,303,340.29	2,557	9,620,472 4,380,274,234.52
Southern.....	1,283	81,564,448	83,202	63,610,419.64	169	66,844,990.22	74	2,747,652.46	16	10,200,345.76	4,610	883,325 239,254,113.91
Middle West.....	1,907	234,518,022	1,227	269,749,704.32	548	277,852,428.44	794	27,100,458.63	179	266,733,296.33	3,260	3,281,262 1,223,093,099.89
Western.....	1,040	40,283,328	15,255	3,338,785.40	48	113,627,000.78	27	1,069,091.78	17	7,127,670.95	3,547	300,815 101,661,124.30
Pacific.....	378	29,878,545.00	650	6,433,644.87	113	239,020,682.44	40	439,201.16	42	10,721,725.69	1,253	78,619 354,101,619.24
Island possessions.....	5	159,183.30	12	4,070,069.85	.....	.....	.....	.....	.....	.....	18	20,050 4,229,243.30



# UNIVERSAL GAZETTEER



**THE EARTH—Shape and Size of the Earth.**—The Earth is very nearly an oblate spheroid, whose shorter axis coincides with its axis of rotation passing through the two poles. It rotates at a velocity of 15 degrees an hour (about 17,366 miles a minute at the equator); a 1 degree is therefore equal to 4 minutes.

The circumference of the globe is about 24,855 miles, and the diameter about 7,900 miles. More exactly—

Earth's equatorial semidiameter equals 3963.290 miles.

Earth's polar semidiameter equals 3949.790 miles.

Earth's mean semidiameter equals 3956.794 miles.

Earth's oblateness equals one-three-hundredths.

One degree of latitude at pole equals 69.407 miles.

One degree of latitude at equator equals 68.704 miles.

The temperature increases on an average about 1 degree F. for every 64 feet descent. But this amount is variable according to the locality, geological formation, and dip of strata. In the Calumet and Ilwaco mines, observations show an increase of 1 degree in about every 125 feet. At Bendigo it is shown to be 1 degree per 80 feet of descent. At Bonchamp colliers, on the other hand, the temperature increases 1 degree F. in only 49 feet.

**Chemical Composition.**—By combining a large number of analyses of rocks of all sorts, F. V. Clarke has estimated the relative amounts of elements in the crust of the earth:

	Per Cent		Per Cent
Oxygen	47.02	Manganese	.07
Silicon	28.06	Sulphur	.07
Aluminum	8.16	Barium	.05
Strontium	4.64	Silver	.02
Calcium	3.50	Chromium	.01
Magnesium	2.62	Nickel	.01
Sodium	2.63	Lithium	.01
Potassium	2.32	Chlorine	.01
Titanium	0.41	Fluorine	.01
Hydrogen	0.17		
Carbon	0.12		100
Phosphorus	0.09		

**The Magnetic Pole.**—The geographical poles of the earth are the extremities of the imaginary line passing through its center of gravity and about which it revolves, and are therefore symmetrically located with regard to the equator.

The magnetic poles, however, are not coincident with the geographical poles, nor are they diametrically opposite to each other. The latest results show that the north magnetic pole, or locality where the dip is 90 degrees, is situated in King William's Land, Canada, in about 97 degrees west, 70 degrees north (extending over a considerable area). The position of the south magnetic pole has been located in latitude 72 degrees 23 minutes south and longitude 164 degrees east, by Prof. Edward David and Mr. Douglas Mearns, members of Lieut. Shackleton's expedition to the south pole which left New Zealand on January 1, 1908.

For reason of the annual variation of the magnetic needle, it is believed that the magnetic poles are not stationary, but have a slow motion around the geographical poles.

**The Land.**—The land covers 55,063,000 square miles on the assumption that 250,000 square miles of land remain to be discovered within the arctic regions, and that the supposed antarctic continent has an extent of 2,500,000 square miles within the antarctic circle.

**Heights and Depths.**—The mean height of the land has been estimated at 2,445 feet; the mean depth of the sea, 11,470 feet (Kartastan); the greatest depth of the ocean as yet discovered (in the Pacific, between Guam and Midway) is 31,614 feet. If the whole of the arctic crust of the earth were to be leveled, so as to form a spheroid, it would still be covered by an ocean of a uniform depth of 8,000 feet (Prof. Penck).

**THE OCEANS.**—The oceans, including the inland seas connected with them, cover 141,877,000 square miles, or 72 per cent of the total surface of the earth. There are 2.59 square miles of ocean to every square mile of land. Murray states the greatest depth of the Atlantic Ocean at 27,366 feet; Pacific Ocean, 30,000 feet; Indian Ocean, 18,582 feet; Southern Ocean, 25,200 feet; Arctic Ocean, 9,000 feet. The Atlantic Ocean has an area, in square miles, of 24,536,000; Pacific Ocean, 70,000,000; Indian Ocean, 17,084,000; Arctic Ocean, 5,500,000; Southern Ocean, 30,592,000.

**Antarctic Ocean.**—Is situated about, or within, the antarctic circle. The great Southern Ocean is that part of the ocean which surrounds the world between the latitude of 40 degrees south and the antarctic circle. The northern portions of this sea are often called the South Atlantic, South Indian and South Pacific, while the southern portions are usually called the Antarctic Ocean. The average depth of the continuous ocean which surrounds south polar land is about two miles; it gradually shoals toward antarctic land, and in some places is met with a short distance within the antarctic circle. Life is abundant in the arctic waters, but scarce in the bottom of the ocean. Only five navigators, Cook, Weddell, Ross, Seely, and Shackleton have crossed the 70th parallel south.

(See further, Polar Regions).

**Arctic Ocean.**—Lies to the north of Europe, Asia, and North America, and is situated within the arctic circle; it is usually defined as the water area within the arctic circle. Physiographically, the North Atlantic, the Barents Sea, and the Kara Sea, Norway and Greenland, belong to the same basin as the Arctic Ocean. If the Arctic Ocean is regarded as lying wholly within the arctic circle, then it is almost land-locked, between that circle and the parallel of 70 degrees north. It communicates with the Pacific by Behring strait, and with the Atlantic through Davis strait and the wide sea between Norway and Greenland. The area of the ocean is about 5,500,000 square miles, and into it there drain about 8,000,000 square miles of land.

The coasts of Europe and Asia are low, and have several deep indentations; the principal being the White Sea and Gulf of Ob. The shores of North America are skirted by a most irregular assemblage of islands, forming numerous gulfs, bays, and channels.

(See further, Polar Regions).

**The Atlantic Ocean.**—The Atlantic Ocean separates the old world from the new, and has been likened to a longitudinal valley divided by a series of mountain ranges into an eastern and a western half. Upon those plateaus there rise the volcanic islands of the Azores, St. Paul, Ascension, and Tristan da Cunha. The ocean, including the Mediterranean and other Inland Seas, covers an area of 21,410,000 square miles. Its greatest depth (4,261 fathoms) has been sounded to the north of the Virgin Islands, and has been named the international deep.

The currents are primarily originated by the wind. The trade winds, which blow from the northeast toward the equator, give rise to the northern and southern equatorial currents, which are deflected on reaching the eastern coasts of North and South America, returning toward the Gulf of Guinea (equatorial current or Guinea current), a portion following the northern coast of West Africa, and another the Caribbean Sea and the Gulf of Mexico, where it issues as the gulf stream. It is to the warm waters of the gulf stream that we owe our mild climate and freedom from icebergs. The cold currents flowing out of Baffin bay, southward along the coast of North America, and the cold Southern Ocean along the east coast of South America and the west coast of Africa, produce a series of fogs, and are the lowering of the

**Islands in the Atlantic.**—*Iceland* (Danish).—39,756 square miles, population (1901) 78,470. The island

consists in the main of a plateau, from which rise snow-capped mountains (Jökull) including the twin-peaked volcano. The highest summit is Vatna Jökull, 6,955 feet. There are few trees, and the hilly parts of the island does not exceed 1,600 square miles. Climate comparatively mild and equable. The fisheries and sheep-breeding are of importance. The exports include dried fish, wool, blubber, tallow, eiderdown, ponies, etc. Capital is Reykjavik, population 2,500.

*Bermudes* (British).—A group of coral islands in the northern Atlantic. Area 19 square miles, population (1901) 21,258, including 10,000 whites. Staple exports onions, potatoes, bulls, nearly all being exported to the United States. Of the tonnage entered 88 per cent is British.

*Azores*.—A group of volcanic islands in the North Atlantic, mountainous (Pico, 7,710 feet), but fertile. Area 922 square miles, population 157,000, mostly Portuguese and Roman Catholics. The exports include oranges, wine, cereals, etc. The islands form an integral portion of Portugal. Capital is Ponta Delgada, population 17,000, on St. Michael's.

*Madiera* (Portuguese).—An island of volcanic origin, belonging to Portugal. Hilly (6,100 feet). Climate moist equable, and breezy. Area 314 square miles, population (1900) 150,228, mostly Portuguese. Exports wine, sugar.

*Canaries*.—A group of islands of volcanic origin near the African coast, mountainous (Pico de Teide, on Tenerife, 12,190 feet). Area 2,830 square miles, population 359,290. Staple exports vegetables, bananas, cochineal. The islands form an integral portion of the kingdom of Spain.

*St. Paul*.—A tiny volcanic islet, formerly used as the equator. Uninhabited.

*Fernando de Noronha*.—A hilly island with a Brazilian penal settlement.

*Trinidad*.—Small island, 2,300 feet. Uninhabited.

Belongs to the group of the West Indies.

*Ascension*.—A British island of volcanic origin, rising 2,740 feet. Area 38 square miles, population 1,500. Island of commerce and coaling station. Celebrated for its turtles.

*St. Helena*.—A British island of volcanic origin, rising 7,000 feet. Area 47 square miles, population 5,200.

*Tristan da Cunha* (British).—A group of islands in the southern Atlantic; 45 square miles, population 70.

**Indian Ocean.**—That great body of water which has Asia on the north, the Bunda Isles and Australia on the east, Africa on the west, and the Antarctic Ocean on the south. The Cape of Good Hope and the southern extremity of Tasmania may be considered its extreme southern limits on the west and east. Its length from north to south somewhat exceeds 6,500 miles; its breadth varies from 6,000 to 4,000 miles.

It is traversed by the equatorial current flowing east to west, and its navigation by sailing vessels is more or less modified by the periodic trade-winds and monsoons. Its chief arms are the Bay of Bengal on the east of India, and the Arabian Sea on the west, and the latter being the Persian gulf and Red Sea.

**Islands.**—Some of the most characteristic coral atolls and fringing reefs are to be found toward the central part of the Indian Ocean, such as the great Maldivian group, the Chagos, Diego Garcia, and the Kerguelen Islands. Almost all the tropical shores are skirted by fringing and barrier reefs. Christmas Island is an upraised coral formation. St. Paul's, Mauritius, Rodriguez, and others are of volcanic origin, while Madagascar, Ceylon, and Socotra are typical continental islands.

**Pacific Ocean.**—In its largest and the great divisions of the ocean, occupying about one-half of the water-surface of the globe and more than one-third of the area of the globe. It is situated to the westward of the north, communicating with the Arctic Ocean by the narrow (40 miles) and shallow Behring strait, with the Atlantic Ocean by the deep Southern and Antarctic oceans. Its length from north to south (the antarctic circle) is about 9,000 miles; its greatest width, at the equator, is over 10,000 miles; its area is approximately 70,000,000 square miles. The average depth of the Pacific is 10,000 fathoms, and the depths of the Atlantic, and its bed more uniform. Recent soundings between the Friendly Islands and New Zealand point to a great rise in the water level, fathoms (nearly six miles) not far from Kermadec islands.

In the Pacific the tides never attain the maximum heights for which some parts of the Atlantic and Indian Ocean are celebrated. On all the west

coast of America the rise of the tide is usually below 10 feet, and only in the Bay of Panama does it vary from 12 feet to 18.

The trade-winds of the Pacific are not so regular in their limits as those of the Atlantic, and thus irregularly extend over the Pacific. In the region in the case of the southeast trade-wind than in the case of the northeast. The cause of this is the greater number of islands in the Pacific than in the Atlantic Ocean, which, especially in the hot season, disturb the uniformity of atmospheric pressure by local condensations. The southeast trade-wind remains the whole year through within the northern hemisphere. The southeast trade-wind, on the other hand, advances beyond the equator both in summer and winter, still preserving its original direction. In the region stretching from New Guinea and the Solomon Islands southward there are no regular winds. The zones of the two trade-winds are separated by regions of calms and of light winds, the limits of which vary of course with the varying limits of these zones. In the Chinese seas the terrible typhoon occasionally rages, and may occur at any season of the year.

**Islands.**—The Pacific Ocean is remarkable for the innumerable small islands and island groups which stud its surface, but the area occupied by the truly oceanic islands is very small; they are principally congregated toward the central and western portions of its basin, while the eastern portion is comparatively bare. The largest islands—the Hawaiian Islands, the Philippines, the larger islands—Borneo, New Guinea, Celebes, Java, Sumatra, etc.—are continental. The oceanic islands—the Hawaiian Islands, the Carolines, Gilbert Islands, the Solomons, Fiji, Friendly Islands, Samoa, etc.—of the Pacific are all either volcanic or coral reefs. The volcanic islands within the zone of coral-reef builders being fringed with coral reefs, while many are entirely of coral formation.

**Early Navigation.**—The Portuguese were the first Europeans who entered the Pacific, which they did from the east. Balboa, by 1513 discovered it from the summit of the mountains which traverse the Isthmus of Darien. Magellan sailed across it from east to west in 1520. Brackets, Carles, Behring, Anson, Byron, Bougainville, Cook, Vancouver, Lapourer, and others, traversed it in different directions in the seventeenth and eighteenth centuries.

**POLAR REGIONS.**—Antarctic.—The lands within or near the antarctic circle are imperfectly known, and a very large area around the south pole is altogether unknown. Among land-masses that have long been known to exist in the Antarctic Ocean, though our knowledge of them is very imperfect, are those to which have been attached the names Graham land, Victoria land, Wilkes land, Enderby land, South Shetland islands, etc. The antarctic regions are cold and more inhospitable than the arctic, and partly on account of their remoteness from maritime nations there have been fewer efforts at their exploration, the south pole being far less a goal of discovery than the north.

**Discoveries.**—In 1841-2 Sir James Ross reached the highest south latitude attained till recent years, discovering Victoria land (extending to about 79° south latitude) with its volcanoes Erebus and Terror. His farther progress south was checked by a barrier of solid ice, which he judged to be 300 feet high in parts, and after sailing along this for 100 miles without discovering any break in it he found it stretching away as far as the eye could reach.

A point slightly farther south was attained in 1900 by E. Borchgrevink, but the next great and important advance was made by Capt. Scott, R.N., in command of an English expedition, one of four that set out from Europe to explore the Antarctic Ocean early in the twentieth century. Capt. Scott, who was in command of the *Discovery*, reached Ross' farthest point early in 1902, and then coasted eastward along the glacier ice barrier, reaching a mass of high land in longitude 152°-160°, which was named King Edward VII. Land. Turning back to the neighborhood of Mts. Erebus and Terror, he found the ice barrier, not on the mainland, but took up his quarters there and made a great sledge journey to the southward, which brought him to latitude 82° 17', a point hundreds of miles nearer the pole than Ross' farthest point. Other sledge journeys of exploration were also made, and after spending fully two years within the antarctic circle, the expedition returned in 1904.

The most remarkable of the most recent, Antarctic expedition, was made by the *Nimrod* in command of Lieut. E. H. Shackleton, of the British navy, in 1908-9, during which a latitude of 88° 23' was reached—at

a point 110 miles from the south pole. The results of Shackleton's expedition also included the first ascent of the volcano Erebus, 15,350 feet.

#### ANTARCTIC EXPLORATION

Commander	Nation-ality	Date	South Latitude	Longitude
J. Cook.....	British	1773	67° 5'	142° W.
J. Cook.....	British	1774	71° 15'	100° W.
Belings.....	Russian	1820	67°	Var.
Weddell.....	British	1824	74° 15'	34° W.
D'Urville.....	French	1840	66°	140° E.
James Ross.....	British	1840	71° 59'	Var.
James Ross.....	British	1843	71° 16'	121° E.
Larsen.....	Norw.	1893	69° W.	69° W.
Christensen.....	Swedish	1895	74° 0'	170° E.
De Gerlache.....	Belgian	1899	71° 36'	82° W.
Mohrberg.....	Norw.	1900	78° 50'	165° W.
Scott.....	British	1902	82° 17'	16° W.
Brace.....	British	1904	74° 0'	24° W.
Shackleton.....	British	1909	88° 23'	—

**Arctic Regions.**—Comprise the regions round the north pole, and extending from the pole on all sides to the arctic circle in latitude 66° 32' north. The arctic or north polar circle is the northern limit of the northern hemisphere, cuts off the southern and narrowest

rior, a lofty plateau is covered with a cap of ice, from which glaciers descend into the sea. Only 34,000 square miles are included as habitable. Population 11,895. Of trees there are only dwarf willows and birches, and a juniper tree in the extreme south. Fishing and hunting are the principal occupations. Exports are walrus, cod-liver oil, seal-skins. Capital is Godthaab.

**Arctic Islands of America.**—529,000 square miles (432,000 square miles within the arctic circle). At most a thousand inhabitants. All the other islands within the arctic circle are uninhabited.

**Svalbergen.**—2,570 square miles, a group of mountainous islands, accessible almost throughout the year along its western shore. There are reindeer, ice bears, forces. The island is frequented by sealers and whalers, but has no permanent inhabitants.

**Novaya Zembla.**—(New Land) 35,500 square miles, Samoyed fishing settlement.

**Frans Jozef Land.**—7,400 square miles as far as known. No inhabitants, and difficult of access.

**The Arktis Islands.**—10,800 square miles. The first coast of Siberia, including New Siberia. Uninhabited.

**Wrangel Land.**—1,800 square miles. Uninhabited.

The most notable expeditions of discovery in the arctic regions are given in the following table:

#### ARCTIC EXPLORATION

Commander	Nation-ality	Date	N. lat. and	Locality
John Davis.....	British	1587	72° 41'	West Greenland.
Wm. Barents.....	Dutch	1594	75° 20'	Novaya Zembla.
Henry Hudson.....	British	1607	80° 23'	Greenland and Spitzbergen.
Hilary Hudson.....	British	1610	—	Hudson Strait.
William Baffin.....	British	1616	76° 45'	Smith sound.
Belcher.....	British	1728	70° 45'	East Behring Strait.
Tchelyuskin.....	Russian	1743	77° 48'	North Siberia.
C. P. Phipps.....	British	1773	80° 30'	Spitzbergen Sea.
William Scoresby.....	British	1806	71° 12'	East Greenland.
W. E. Parry.....	British	1827	82° 43'	Spitzbergen Sea.
John Franklin.....	British	1846	—	North Canada.
E. B. Kane.....	Amer.	1854	78° 45'	Smith Sound.
O. Nordenskiöld.....	Swede	1868	81° 42'	Spitzbergen Sea.
C. A. Adams.....	Amer.	1870	81° 42'	East Behring Strait.
Julius Paeyer.....	Austrian	1874	82° 5'	East, Franz Josef Land.
G. R. Nares.....	British	1876	83° 20'	Grimmell Land.
Nordenskiöld.....	Swede	1876	86° 9'	North-east passage.
—.....	—	1882	83° 24'	North Greenland.
Frederick Jackson.....	British	1896	81° 20'	Frans Josef Land.
Frederick Jackson.....	British	1896	80° 54'	East of Frans Josef Land.
Hubert of Albatraz.....	Italian	1900	80° 33'	North of Frans Josef Land.
R. H. Peary.....	Amer.	1906	87° 6'	North of Grant Land.
F. A. Cook.....	Amer.	1908	—	Claimed to have reached the pole, April 21.
R. E. Peary.....	Amer.	1909	—	Reached the pole April 6.

portion of Greenland, crosses Fox's Strait north of Hudson's bay, whence it goes over the American continent to Behring Strait. Thence it runs to Odorsk at the mouth of the Ob, crosses northern Russia, the White Sea, and the Scandinavian peninsula, and returns to Iceland.

Though much skill and heroism have been developed in the exploration of this portion of the earth, there is still an area around the pole, estimated at 2,500,000 square miles, which is a blank to geographers.

Valuable minerals, fossils, etc., have been discovered within the arctic regions. In the arctic north of the American continent excellent coal frequently occurs. The mineral erodite is mined in Greenland. Fossil ivory is obtained in Iceland at the mouth of the Lena. In Scandinavia, parts of Siberia, and northwest America, the forest region extends within the arctic circle. The most characteristic features of the arctic regions are the Estivans. The most notable animals are the white bear, the musk-ox, the reindeer, and the whalebone whale. Fur-bearing animals are numerous. The most intense cold ever registered in those regions was 73° below zero Fahrenheit. The aurora borealis is a brilliant phenomenon of arctic nights.

**Islands.**—Within the arctic circle, as far as discovered, there exist an area of 2,333,000 square miles. The more important of these islands are:

**Greenland.**—838,000 square miles, of which 717,000 are within the arctic circle. The inter-

**THE CONTINENTS.**—Europe.—Is geographically merely a peninsula of Asia. It is bounded by the Arctic Ocean, the open Atlantic and the Mediterranean, and separated from Africa and Asia only by narrow straits. Development of coastline 19,820 miles, or one-ninth of coast to every 182 square miles. Extent from the North Cape to Cape Malapan 2,400 miles, from Cape St. Vincent to the Straits of Gibraltar 3,450 miles. Total area 3,811,273 square miles, including peninsulas, and islands.

**Surface.**—The Alps form the backbone of the most vital part of the continent, and constitute a well-marked physical boundary between north and south. They send branches into Italy and the Balkan peninsula, and reappear eastward in the Carpathians. On their outer side they are encircled by the Cevennes, the Jura, and other ranges, the land thus enclosed constituting a tableland. Isolated mountain ranges are those of Scandinavia, of the Iberian peninsula, and the Ural. The great lowland of Europe stretches from the Pyrenees to the Ural, and from the Arctic to the Black Sea. It covers over 1,000 million square miles. Minor plains are those of Hungary, of Rumania, and of the Po.

**Rivers and Lakes.**—Rivers are numerous, and give ready access to the heart of the continent. The most important basin is that of the Caspian Sea, fed by the Volga (drainage area 563,630 square miles). Other large rivers are the Danube (318,416 square miles), Dnieper (203,480 square miles), Don (160,120 square

miles), Drina (141,080 square miles), Pechora (127,260 square miles), and Rhine (86,640 square miles). Ladoga is the largest lake. **Climate.**—The greater part of Europe lies within the temperate zone, and is subject to the beneficial influence of the gulf stream the extremes of heat and cold are moderated, and the rainfall is sufficient. Under the arctic circle, on the coast of Norway, the mean temperature is the same as at Quebec, 47° north.

**Races.**—1. European Aryans, 384,957,000, including 134,073,000 Teutons, 116,056,000 Greco-Latins, 131,221,000 Slav, 2. Asiatic Aryans (Gypsies, etc.) 654,000. 3. Semites (Jews, etc.) 8,965,000. 4. Mongolians (Turks and Tartars, Magyars, Finns, etc.) 23,204,000. **Religions.**—1. Christians, 401,002,000 (184,666,000 Roman Catholic, 112,666,000 Greek Catholic, 103,515,000 Protestants, 155,000 Armenians). 2. Jews, 8,690,000. 3. Mohammedans, 6,982,000. 4. Buddhists, etc., 161,000. 5. Heathen (including most of the Gypsies), 210,000.

**Political Divisions.**—Three great state systems (according to language or nationality), viz.: 1. Teutonic states, 630,073 square miles, population 150,850,000, of whom Teutons 83 per cent, Protestants 61 per cent. 2. Greco-Latin states (including Belgium and Roumania), population 112,666,000, of whom Greco-Latin 94 per cent, Roman Catholic 92 per cent. 3. Slav states (including Bosnia), population 128,256,000, of whom Slavs 82 per cent, Greek Catholic 78 per cent. 4. Hungarian, population 20,025,000, of whom Magyars 45 per cent, Roman Catholic 61 per cent. 5. Turkey, population 6,130,000, of whom Turks 12 per cent, Mohammedans 41 per cent.

**Asia.**—The great continent of the old world, is really one with Europe, which is merely its largest and most important peninsula, and is joined to Africa by the Isthmus of Suez. Development of coast line 36,000 miles, or one mile of coast to every 473 square miles. Distance from Asia Minor to Behring strait 5,990 miles; from Cape Cheiryuskin to Cape Bait, near Singapore, 8,315 miles. Total area 17,048,000 square miles (of which mainland 10,003,000 square miles) inclusive of peninsulas and islands.

**Surface.**—The lofty plateau of Tibet rises in the center of Asia like a huge citadel. It is bounded on the south by the Himalayas, on the north by the Kuen-lun; ramifies in the east, and southeast to the coast of China, and is continued in the west by the Hindu Kush and the plateaus of Iran, Armenia and Asia Minor. A second plateau, of much inferior height, lies to the north of Tibet, being girt by the Pamir, the Fergana and other ranges. It includes the basin of the Tarim, the Turfan basin, believed to be depressed below the sea-level, and the great desert of Gobi. The principal isolated highland regions of Asia are the mountains of Korea, the Decan, the mountains of Syria and Arabia, the Caucasus, the Caspian range, Kurdistan and the great Sierra to the Arctic Ocean; that of the Euphrates and Tigris, of Hindustan and China.

**Rivers and Lakes.**—A large portion of inner Asia forms a continental basin, sending no river to the sea, and in many parts riverless. Within it lie the Caspian Sea, 384 feet below sea-level; Lake Aral, fed by the Syr and Amu Daria (Oxus); Lake Balkash with the Ili, Lob Nor, Kuku Nor. The great rivers of the continent are the Ob (draining an area of 1,190,000 square miles), the Yenisei (587,000 square miles), which flows through Lake Baikal (12,441 square miles); the Lena (871,000 square miles); the Amur (907,000 square miles); the Irtysch (840,000 square miles); the Yangtze-kiang (723,000 square miles); the Ganges (500,000 square miles), and the Euphrates (255,000 square miles).

**Climate.**—Great contrasts between the very cold of North Siberia and the hot damp of the Malay archipelago. Temperature is generally lower than that of Europe under similar latitudes, and the range between summer and winter is greater. In the East, except parts of central Asia, little or no rain falls.

**Races.**—1. European Aryans, as colonists or permanent residents, numerous only in Siberia

(Russians) and Asia Minor (Greeks), 12,055,400. 2. Asiatic Aryans, viz., Hindus, Afghans, Baluchi, Persians, Kurds, Armenians, Caucasians, etc., 229,707,000. 3. Semites (Arabs, Jews, etc.), 7,900,000. 4. Mongolians, including Mongols, Turks and Tartars, Chinese, Japanese, Tungus, etc., 509,812,000. 5. Malays, 45,835,000. 6. Dravidians, India, 64,788,000. 7. Various, 450,000, including a few Eskimo (Chukchi), negroes, etc.

**Religions.**—1. Christianity, although Asia was its birthplace, only numbers 29,516,000 adherents, of whom 13,215,000 in the Russian empire. 2. Jews, 462,300. 3. Mohammedans, 173,039,000, of whom 67,115,000 within the British possessions. 4. Hindus, Buddhists, Hindu, Buddhist, Confucian, etc., number 685,109,000 adherents. 5. Heathen, 12,670,000.

**Political Divisions.**—European possessions, population 380,900,000, including British Asia, population 308,316,000; Dutch Asia, population 30,000,000; Russian Asia, population 27,732,000 (35 per cent European, 41 per cent Mongol and Turk); French Asia, population 25,800,000; American Asia (Philippines), population 7,635,000; Portuguese Asia (Goa, Timor), population 705,000. 2. Mohammedan states (Turkey, Persia, Afghanistan, independent Asia), population 31,799,000. 3. Mongolian states (China, Japan, Siam, Korea, Nepal, etc.), population 500,000,000.

**Africa.**—Is attached to Asia by the Isthmus of Suez, separated from Europe by the Mediterranean. Africa extends 4,980 miles from north to south (Cape Bianco in Tunis to Cape Aguilha), and 4,840 miles from west to east (Cape Verde to Cape Guadalupe). Its area, including Madagascar and other islands, is 11,520,000 square miles.

**Surface.**—Nearly all Africa is a plateau. There are no extensive lowlands, but a few localities are depressed below the level of the sea (Shab Meir, Siwah, Fayum). The mean elevation is 1,975 feet. The Atlas mountains form a distinct highland region (Aynashin, 14,150 feet), the Abyssinian highlands, 10,000 feet. Daashan rises 15,300 feet, but the loftiest summits of all Africa are found in the East African lake region, Kilimanjaro, 19,270 feet; Kenia, 17,150 feet; Ruwenzori, 16,815 feet.

**Rivers and Lakes.**—Among the rivers the Nile is the most famous, but the Congo has the largest basin. Other rivers are the Niger, the Zambezi, and the Orange river. Among the continental basins (having no drainage to the sea), those of Lake Chad, Lake Ngami, Lake Rudolf and the Hawash are the most conspicuous. The largest lakes are the Victoria Nyanya, Taad, Tanganyika, Nyansa and Rudolf.

**Climate.**—Only one-fifth of Africa lies within the temperate zone. At the sea-level a mean temperature of less than 68° is experienced only in Barbary and in the coast-region of South Africa from Durban to Mossmedes. The Mediterranean coasts and a small part of the Cape Colony have winter showers, while the greater part of the continent has tropical rains. Two extensive regions—viz., the Sahara, in the north, and the Kalahari adjoining districts, in the south—are almost rainless.

**Races.**—1. Negroes, 87,517,000, classed into Sudan negroes, Bantu, and the scattered tribes of pygmies among them. 2. Hamites, 10,964,000, viz., Berbers, Arabs, Tuareg, in Barbary and the Sahara; Copts, Beja, and Nuba, in the Nile valley; Agua, etc., in Abyssinia; Danakil, Somali, and Galla, in East Africa. 3. Semites, 26,044,000, including Arabs and Abyssinians, both much mixed with Berber and negro blood. 4. Hottentots and Bushmen, 420,000, in South Africa. 5. Malays, principally in Madagascar, 2,516,000. 6. Europeans, 3,410,000, of whom 961,000 are in continental North Africa, 1,115,000 in South Africa, and only 61,000 in tropical Africa. 7. Hindus and other Asiatics, as laborers in the Mascarenes, 401,000; 8. Egyptians, 1,000,000.

**Religions.**—1. Christians, 9,788,000, including Copts and Abyssinians. 2. Mohammedans, 31,272,000, including all Arabs and Berbers,

Beja, Nuba, Somali, increasing numbers of other Hamites, and negroes. 3. Jews, 450,000. 4. Buddhists, etc., 304,000. 5. Heathen, 89,500,000.

**Political Divisions.**—Nearly all Africa has now been absorbed or partitioned by various European powers, but most native tribes or states included within European spheres are still virtually independent. Egypt and the Egyptian Sudan, although nominally under the suzerainty of Turkey, are really controlled by Great Britain. The remaining territory of Africa unoccupied is a part of the great desert of Sahara and the independent states of Abyssinia, Liberia, and Morocco.

**North America.**—Forms the north and larger portion of the new world discovered by Columbus. It is separated from Europe by the Atlantic Ocean and from Asia by Behring strait. Its main mass is triangular in shape, and its outline varied by large peninsulas, broad gulfs and numerous bays. Development of coast line 25,130 miles. Length, 4,500 miles; breadth, 3,100 miles. Area, 9,419,469 square miles, including Greenland, the Arctic Archipelago of Tehuantepec to the Arctic Ocean. In the center it broadens out, and inclosed within is a great basin having no outlet to the sea. The highest summits are Mt. McKinley, in the north; Mt. Harvard, in the Rocky mountains; Mt. Whitney, in the Sierra Nevada; and the Popocatepetl or Peak of Orizaba, in Mexico. The Appalachian highlands in the east form the second great mountain system, and are continued to the north of the St. Lawrence in the Laurentides, the Canadian lake plateau and the arctic highlands. A great central plain lies between these mountains, extending from the Gulf of Mexico to the arctic regions. The mean height of the continent is 2,730 feet.

**Rivers and Lakes.**—The great rivers of North America are the Mississippi, with its tributaries, 1,240,039 square miles; the St. Lawrence, which has for its reservoirs the Great lakes, and drains 532,190 square miles; the Saskatchewan, with its tributaries, 472,206, which enters Hudson's bay and drains 449,830 square miles; the Mackenzie, tributary to the Arctic Ocean, drains 679,400 square miles. The great lakes cover 88,330 sq. mi.

**Climate.**—Largely determined by the direction of the mountain ranges. Five climatic regions, viz., an arctic region, whose mean temperature is less than 32° F.; an Atlantic temperate region, extending as far as the Mississippi, with abundant rains and dense woods; an inland temperate region, dry, with steppes or prairies; a Pacific coast region; and a tropical region.

**Race.**—82,901,000 Europeans, 14,367,000 Americans, 16,121,000 Indians and Eskimos, 1,168,000 Semites (Jews), 157,300 Mongols (Chinese and Japs), 18,000 Asiatic Aryans (coolies). Of the Indians, only 420,000 are within the limits of the United States and the United States, while in Mexico and the other Spanish republics they constitute the bulk of the population. Of negroes about 11,000,000, in the United States and British North America, while only 3,087,000 are to be found in the West Indies and elsewhere.

**Religions.**—1. Christians, 379,000. 2. 1,215,000 Jews. 3. 174,000 Buddhists, etc., 142,000 heathen.

**Political Divisions.**—British North America, population 7,352,000; United States, not including Alaska, population 91,870,000; Latin republics, population 19,468,000; French, population 378,930; Danish, population 42,500; Dutch, population 6,800; Cuba, population 2,048,980; Hayti, population 2,010,000.

**South America.**—Forms the south half of the new world. In shape triangular, it extends 4,550 miles from north to south, 3,390 miles from east to west. Its coast line is far less broken than that of North America and there are fewer islands. Development of coast line 15,700 miles, or one mile to

every 435 square miles of mainland. Total area, 6,881,700 square miles, of which islands comprise 81,321 square miles.

**Surface.**—The Cordilleras de los Andes extend close to the Pacific, from southern extremity of the continent as far as the Caribbean Sea, and send a branch eastward into Venezuela. Their parallel ranges inclose several plateaus, among which that of Bolivia is the most extensive. The loftiest summits are: Aconcagua; Illimpu, or Peak of Sorata; Chimborazo. Isolated mountain regions are the Sierra Nevada de Sta. Marta, on the Caribbean Sea; the highlands of Guayana (Roraima), and the Brazilian highlands (Itatiaia). Vast lowland plains, covering altogether

nearly 70 per cent of the total area, lie between these mountains, and open out upon the Atlantic. These plains include the llanos or stepping-places of the Orinoco, the selvas or forests of the Amazon river, and the plains of the Rio de la Plata. Mean elevation of the continent, 2,490 feet.

**Rivers and Lakes.**—Nearly the whole drainage is toward the Atlantic. The three great rivers are the Orinoco (drains 328,000 square miles), the Amazon (drains 2,700,000 square miles), and the Rio de la Plata (drains 1,240,000 square miles).

**Climate.**—The Andes form a sharp climatical boundary, and while the rainfall is generally

abundant to the east of them, it is deficient or falls altogether on the Pacific coast, from latitude 4 degrees south to 30 degrees south. Races.—13,260,000 Europeans, 20,000,000 American Indians, 9,072,000 negroes, 200,000 Asiatic Aryans (coolies), 33,500 Semites (Jews and Arabs), 56,000 Mongols (Chinese), 4,000 Malays.

**Religions.**—40,631,000 Christians, 30,000 Mohammedans, 34,000 Jews, 229,000 Buddhists, etc., 1,863,000 heathen.

**Political Divisions.**—British South America, population 608,000; French, population 33,000; Dutch, population 156,400; Brazil (Portuguese), population 19,910,640; Spanish states, population 25,510,000.

INDEPENDENT COUNTRIES OF THE WORLD. TABLE I. GOVERNMENTS AND RULERS

COUNTRIES	CAPITAL	FORM OF GOVERNMENT	TITLE OF RULER	PRESENT OFFICIAL HEAD	BORN	ACCERD	SALARY OR INCOME
Abyssinia	Addis Ababa	Feudal monarchy	King	Menelik II.	1843	March 12, 1889	.....
Afghanistan	Cabul	Monarchy	Amir	Habibullah Khan	1872	Oct. 3, 1901	.....
Argentina	Buenos Ayres	Republic	President	Rogus Herra Pena	.....	Mar. 12, 1910	\$ 50,000
Australia	Melbourne	British dependency	Governor-general	Earl of Dudley	.....	.....	.....
Austria-Hungary	Vienna	Monarchy	Emperor	Francis Joseph	Aug. 18, 1830	Dec. 2, 1848	4,520,000
Belgium	Brussels	Monarchy	King	Albert	April 8, 1879	Dec. 2, 1909	623,600
Bolivia	La Paz	Republic	President	Eliodoro Villazon	.....	Oct. 24, 1909	.....
Brazil	Rio de Janeiro	Monarchy	Emperor	Baron de Copacabana	.....	1910	40,000
Bulgaria	Sofia	Monarchy	Czar	Ferdinand	Feb. 26, 1861	Aug. 11, 1887	250,000
Canada	Ottawa	British dependency	Governor-general	Earl Grey	.....	.....	50,000
Chile	Santiago	Republic	President	Ramon Barros Luce	.....	1910	7,000
China	Peking	Autocracy	Emperor	Pu-yi (Huantung)	Feb. 11, 1906	1908	.....
Colombia	Bogota	Republic	President	Ramon Gonzalez Valencia	.....	1909	.....
Costa Rica	San Jose	Republic	President	Ricardo Jimenez	.....	1909	.....
Cuba	Havana	Republic	President	Xo Miguel Gomez	1853	Jan. 1909	25,000
Denmark	Copenhagen	Monarchy	King	Frederick VIII.	June 28, 1843	Jan. 29, 1906	215,500
Ecuador	Quito	Republic	President	Eloy Alfaro	.....	1906	12,000
Egypt	Cairo	Turkish dependency	Khedive	Abbas Facha	July 14, 1874	Jan. 7, 1892	500,000
France	Paris	Republic	President	Armand Fallieres	1841	Jan. 17, 1906	140,000
German Empire	Berlin	Monarchy	Emperor	William II.	Jan. 27, 1859	June 15, 1888	3,700,000
Greece	Athens	Monarchy	King	George	June 3, 1845	May 6, 1910	2,530,000
Guatemala	Guatemala	Republic	President	Manuel Estrada Cabrera	Dec. 24, 1815	Oct. 31, 1903	260,000
Haiti	Port au Prince	Republic	President	Antoine Simon	Dec. 24, 1856	Sept. 23, 1908	.....
Honduras	Tegucigalpa	Republic	President	Miguel R. Davila	.....	April 18, 1907	24,000
India	Calcutta	British viceroyalty	Viceroy	Earl of Minto	July 9, 1845	Nov. 1905	83,600
Italy	Rome	Monarchy	King	Victor Emmanuel III.	Nov. 1, 1859	Feb. 29, 1900	2,650,000
Japan	Tokyo	Monarchy	Mikado	Mutsuhito	Nov. 8, 1852	July 13, 1867	2,350,000
Liberia	Monrovia	Republic	President	Arthur Barclay	1854	.....	.....
Luxemburg	Luxemburg	Republic	Grand duke	William	April 22, 1852	Nov. 19, 1905	50,000
Mexico	Mexico	Republic	President	Albino	Nov. 13, 1848	Sept. 10, 1889	24,000
Monaco	Monte Carlo	Monarchy	Prince-bishop	Nicholas	Oct. 7, 1841	1910	.....
Montenegro	Cettigne	Monarchy	King	Nicholas	1873	1908	.....
Morocco	Fes	Despotism	Sultan	Surendra Bikram Shah	Aug. 8, 1875	May 17, 1881	250,000
Nepal	Katmandu	Monarchy	Queen	Wilhelmina	Aug. 31, 1880	Sept. 5, 1898	.....
Nicaragua	Managua	Republic	President	Jose J. Estrada	.....	Nov. 5, 1910	185,000
Norway	Christiania	Monarchy	King	Haakon VII.	Aug. 3, 1872	Nov. 18, 1905	250,000
Oman	Muscat	Despotism	Sultan	Seyid Fayzal bin Turke	.....	June 4, 1888	24,000
Panama	Panama	Republic	President	Carlos A. Mendoza	.....	March 1, 1910	9,500
Paraguay	Asuncion	Republic	President	E. Gonzalez Navero	1897	1909	.....
Peru	Lima	Monarchy	Shah	Ahmed Mirza	.....	1908	.....
Portugal	Lisbon	Republic	President	Theophile Braga	1835	1910	.....
Roumania	Bucharest	Monarchy	King	Charles	April 20, 1859	Mar. 26, 1881	227,520
Russia	St. Petersburg	Monarchy	Czar	Nicholas II.	May 18, 1868	Nov. 2, 1904	12,000,000
San Domingo	San Salvador	Republic	President	Fernando Figueroa	.....	Jan. 1907	.....
Serbia	Belgrade	Monarchy	King	Peter (Karageorgievich)	.....	June 15, 1909	223,000
Siam	Bangkok	Monarchy	King	Vajiravudh	1880	Oct. 23, 1910	2,500,000
Spain	Madrid	Monarchy	King	Alfonso XIII.	May 17, 1886	May 17, 1886	1,344,000
Sweden	Stockholm	Monarchy	King	Gustaf V.	Dec. 16, 1859	Dec. 8, 1907	1,545,000
Switzerland	Berne	Republic	President	Michele Rubet	1847	1901	3,000
Turkey	Constantinople	Monarchy	Sultan	Mohammed V.	.....	1909	7,500,000
United States	Washington	Republic	President	William Howard Taft	Sept. 15, 1857	March 4, 1909	73,000
Uruguay	Montevideo	Republic	President	Claudio Willman	.....	March 1, 1907	36,000
Venezuela	Caracas	Republic	President	Juan Vicente Gomez	1839	Dec. 1908	.....

TABLE II. STATISTICS AND INDUSTRIES

COUNTRIES	POPULATION	AREA SQUARE MILES	PAULIC DEBT	MILES OF RAILROAD	MILES OF TELEGRAPH	STANDARD CURRENCY	CHIEF INDUSTRIES	LEADING PRODUCTS AND EXPORTS
Abyssinia	6,000,000	215,400	.....	248	1,050	.....	Groceries	Ivory, musk, coffee, hides.
Afghanistan	4,305,684	1,225,840	\$ 545,712,126	20,000	34,960	Gold	Manufacture of goods and fruits.	Silks, carpets, fruits, shawls.
Argentina	4,973,359	261,035	1,963,725,105	13,425	27,570	Gold	Grazing and agriculture.	Wool, meat, hides, grain.
Austria-Hungary	.....	.....	.....	12,100	16,103	Gold	Agriculture.	Grain, fruits, wine, cattle.
Australia	7,074,910	11,373	663,325,145	2,860	4,320	Gold	Manufacture of goods and fruits.	Glassware, linens, textiles.
Brazil	80,000,000	900,000	20,089,409	418	2,810	Silver	Agriculture and mining.	Sugar, rubber, coffee.
Bolivia	2,267,935	709,000	2,853,496	11,830	17,014	Gold	Agriculture and mining.	Coffee, cocoa, diamonds, gold.
British Empire	410,000,000	11,400,000	3,669,931,350	23,280	304,562	Gold	Agriculture, manufacturing and commerce.	Manufactures, textiles, cutting and commerce.
United Kingdom	41,609,320	120,979	3,669,931,350	23,280	304,562	Gold	Agriculture and mining.	Sugar, cotton, rice, coffee, opium.
India	300,000,000	1,770,000	1,346,997,187	31,490	280,958	Gold	Agriculture and mining.	Copper, fisheries, lumber, cereals.
Canada	7,200,000	3,745,574	322,930,279	24,104	33,222	Gold	Agriculture and mining.	Copper, fisheries, lumber, cereals.



TABLE II. STATISTICS AND INDUSTRIES—Continued

COUNTRIES	POPULATION	AREA SQUARE MILES	PUBLIC DEBT	Miles of Railroad	Miles of Tele- graph	Standard Cur- rency	CHIEF INDUSTRIES	LEADING PRODUCTS AND EXPORTS
<b>British Empire—Continued</b>			\$					
Australia	2,972,573	3,774,282	1,184,192,157	16,250	44,554	Gold	Agriculture and min- ing.	Wool, gold, grain.
New Zealand	888,072	102,993	346,430,001	2,711	10,404			Wool, meat, gold, dairy products.
South Africa	6,000,000	1,200,000	.....	4,242	8,221			Gold, diamonds, wool.
Malay States	.....	.....	.....	.....	.....			Tin, spices, sugar, India- rubber.
<b>Bulgaria</b>	2,744,300	37,300	93,500,975	987	3,687	Gold	Agriculture and grazing.	Cereals, eggs, dairy products.
<b>Central America</b>								
Costa Rica	351,176	18,400	19,683,924	294	1,207	Gold	Silver	Coffee, hides, cedar, rubber.
Guatemala	1,804,000	48,290	19,083,501	409	6,600	Gold		Silver, gold, coffee, rubber.
Honduras	745,000	46,250	110,982,932	69	2,840	Silver	Agriculture and mining.	Bananas, coffee, sugar, gold, silver.
Nicaragua	600,000	49,200	6,083,195	173	1,591	Silver		Mahogany, gold, gum ara- bic, coffee, rubber.
San Salvador	1,707,000	7,225	12,035,397	100	2,500	Silver	Gold	Coffee, rubber, sugar, tobacco.
Chili	2,249,092	291,544	167,069,373	3,288	22,403	Gold		Wheat, nitrate, copper, silver.
China	433,553,000	4,271,170	601,916,605	4,142	25,913	Silver	Agriculture.	Silk, rice, tea, opium, indigo, cotton, sugar.
Tibet	4,500,000	435,436	22,853,640	470	10,400	Gold	Agriculture.	Cotton, sugar, coffee, gold.
Cuba	2,048,980	43,164	45,296,385	999	.....	Gold		Sugar, tobacco, coffee, cotton, hard woods.
<b>Denmark</b>	2,585,960	15,385	66,057,034	2,053	8,844	Gold	Agriculture.	Butter, dairy products, rye, barley.
<b>Denmark and Colonies</b>								
Iceland	275,470	.....	750	.....	.....	.....	.....	.....
Greenland	11,895	838,000	.....	.....	.....	.....	.....	.....
West Indies	30,527	138	.....	.....	.....	.....	.....	.....
Ecuador	1,500,000	429,000	21,010,345	325	2,364	Gold	Agriculture.	Coffee, rubber, sarsaparilla, coffee.
<b>France and Colonies</b>			3,898,675,451					
Colonies	38,961,945	207,054	.....	.....	.....	.....	.....	.....
Algeria	4,730,556	184,474	.....	.....	.....	.....	.....	.....
Senegal, etc.	4,323,000	80,719	.....	.....	.....	.....	.....	.....
Tunis	1,900,000	51,000	.....	.....	.....	.....	.....	.....
Cayenne	32,008	30,500	.....	.....	.....	.....	.....	.....
Madagascar	1,500,000	457,400	.....	.....	.....	.....	.....	.....
Cochin-China	2,958,000	37,000	.....	.....	.....	.....	.....	.....
Tonkin	7,000,000	46,400	.....	.....	.....	.....	.....	.....
Si-Siam	31,514	7,000	.....	.....	.....	.....	.....	.....
Calcutta	10,300	600	.....	.....	.....	.....	.....	.....
Sahara	2,550,000	1,544,000	.....	.....	.....	.....	.....	.....
German Empire	63,886,000	208,830	1,094,790,375	36,200	130,694	Gold	Manufacturing, agri- culture, commerce.	Iron, goods, drugs and chemi- cals, scientific instruments, wines, linens.
<b>German Empire in Europe</b>								
Prussia	37,293,324	134,603	.....	.....	.....	.....	.....	.....
Bavaria	6,524,372	29,292	.....	.....	.....	.....	.....	.....
Saxony	4,509,601	20,719	.....	.....	.....	.....	.....	.....
Württemberg	2,302,179	7,534	.....	.....	.....	.....	.....	.....
Baden	2,010,728	5,523	.....	.....	.....	.....	.....	.....
Alsace-Lorraine	1,814,564	8,008	.....	.....	.....	.....	.....	.....
Hesse	1,206,175	2,960	.....	.....	.....	.....	.....	.....
Mecklenburg-Schwerin	625,045	6,068	.....	.....	.....	.....	.....	.....
Hamburg	874,878	160	.....	.....	.....	.....	.....	.....
Brunswick	485,958	1,424	.....	.....	.....	.....	.....	.....
Oldenburg	438,856	2,179	.....	.....	.....	.....	.....	.....
Saxe-Weimar	388,095	1,297	.....	.....	.....	.....	.....	.....
Anhalt	328,029	906	.....	.....	.....	.....	.....	.....
Saxe-Meiningen	268,916	953	.....	.....	.....	.....	.....	.....
Saxe-Coburg-Gotha	242,432	755	.....	.....	.....	.....	.....	.....
Bremen	293,440	99	.....	.....	.....	.....	.....	.....
Saxe-Altenburg	206,508	811	.....	.....	.....	.....	.....	.....
Lippe	145,577	479	.....	.....	.....	.....	.....	.....
Rhine (Younger line)	144,544	319	.....	.....	.....	.....	.....	.....
Mecklenburg-Strelitz	103,451	1,131	.....	.....	.....	.....	.....	.....
Schwartzburg-Rudolstadt	96,835	393	.....	.....	.....	.....	.....	.....
Schwartzburg-Sondershausen	85,152	333	.....	.....	.....	.....	.....	.....
Lubeck	105,857	115	.....	.....	.....	.....	.....	.....
Waldick	69,127	60	.....	.....	.....	.....	.....	.....
Rhine (Elder line)	70,603	122	.....	.....	.....	.....	.....	.....
Schwartzburg-Lippe	44,992	131	.....	.....	.....	.....	.....	.....
German Africa	12,210,000	931,000	.....	.....	.....	.....	.....	.....
Greece	2,433,806	26,014	157,877,067	845	4,833	Gold	Agriculture.	Fruits, wines, olive oil.
Hayti	1,400,000	10,204	26,468,849	42	.....	Gold	Agriculture.	Coffee, logwood, cocon, ma- hogany.
<b>Italy</b>	32,475,253	110,530	2,002,290,757	10,445	31,150	Gold	Agriculture.	Wine, silk, oil, sulphur, cot- ton, fruit.
<b>Italy and Colonies</b>								
Abyssinia	36,825,253	449,050	.....	.....	.....	.....	.....	.....
Eritrea	3,500,000	150,000	.....	.....	.....	.....	.....	.....
Italian Coast	450,000	85,500	.....	.....	.....	.....	.....	.....
Japan	400,000	100,000	.....	.....	.....	.....	.....	.....
Formosa	51,458,037	162,153	1,287,604,261	5,029	19,744	Gold	Agriculture.	Rice, silk, porcelain, tea, sugar, textiles.
Korea	10,519,000	82,000	18,297,238	609	2,170	.....	.....	.....
Liberia	2,060,000	35,000	1,290,571	.....	.....	.....	.....	.....
Mexico	15,607,269	767,000	219,869,231	18,550	39,965	Gold	Agriculture and mining.	Palm oil, coffee, rubber, ivory.
Monaco	18,000	.....	.....	.....	.....	.....	.....	.....
Montenegro	228,000	8,630	.....	.....	.....	.....	.....	.....
Morocco	5,000,000	219,000	39,758,000	.....	.....	.....	.....	.....
Nepal	4,000,000	54,000	.....	.....	.....	.....	.....	.....
Netherlands	8,525,198	12,648	451,309,203	1,908	4,553	Silver	Grass and agriculture.	Wool, drugs, dyes, cereals.
<b>Netherlands and Colonies</b>								
Borneo	41,347,182	795,448	.....	.....	.....	.....	.....	.....
Celebes	2,000,000	284,840	.....	.....	.....	.....	.....	.....
Java	1,878,473	71,470	.....	.....	.....	.....	.....	.....
Moluccas	30,098,000	80,554	.....	.....	.....	.....	.....	.....
Moluccas	410,190	43,864	.....	.....	.....	.....	.....	.....

TABLE II. STATISTICS AND INDUSTRIES—Continued

COUNTRIES	POPULATION	AREA SQUARE MILES	Public DEBT	Miles of Railroad	Miles of Tele- graph	Standard Cur- rency	CHIEF INDUSTRIES	LEADING PRODUCTS AND EXPORTS
Netherlands—Continued								
New Guinea	200,000	151,789	.....	.....	.....	.....	.....	.....
Sumatra	4,029,503	161,612	.....	.....	.....	.....	.....	.....
Surinam	70,007	46,000	.....	.....	.....	.....	.....	.....
Luxemburg	.....	2,316,000	.....	.....	.....	.....	.....	.....
Norway	2,240,052	124,129	88,253,614	1,849	11,725	Gold	Mining and lumbering.	Iron, lumber, copper, fisheries.
Oman	1,500,000	82,000	.....	.....	.....	Silver	Agriculture and fisheries.	Dates, limes, pearls, fish.
Panama	360,542	2,300	.....	.....	47	.....	.....	Bananas, rubber, coconuts, hides.
Paraguay	638,571	196,349	5,027,141	153	1,960	Silver	Grain and agriculture.	Meat, tobacco, hides, timber.
Peru	7,653,000	628,000	10,737,500	6	4,312	Silver	Agriculture and manu- facturing.	Cerise, wool, fruits, tobacco.
Portugal	4,500,000	697,640	24,911,789	1,478	4,540	Gold	Agriculture and mining.	Silver, copper, gold, coffee, wool, grain.
Portugal and Colonies	5,423,132	35,490	864,561,212	1,758	5,860	Gold	Agriculture.	Wines, silk, fruits, cork, sardines.
Portugal and Colonies	14,582,084	838,442	.....	.....	.....	.....	.....	.....
Portuguese Africa	8,248,527	793,980	.....	.....	.....	.....	.....	.....
Portuguese Asia	893,749	8,972	.....	.....	.....	.....	.....	.....
Roumania	5,912,520	50,720	277,383,133	2,054	756	Gold	Agriculture.	Cereals, iron, copper.
Russian Empire	.....	.....	4,558,152,565	51,604	120,238	Gold	Agriculture.	Wheat, rye, oats, timber, furs, hemp, petroleum.
European Russia	113,841,000	1,862,524	.....	.....	.....	.....	.....	.....
Poland	11,360,900	47,018	.....	.....	.....	.....	.....	.....
Czechoslovakia	4,601,200	84,000	.....	.....	.....	.....	.....	.....
Total, Russia in Europe	129,803,100	1,996,743	.....	.....	.....	.....	.....	.....
Trans-Caucasia	6,307,200	95,402	.....	.....	.....	.....	.....	.....
Siberia	7,049,300	4,786,730	.....	.....	.....	.....	.....	.....
Sao Domingo	610,000	18,045	13,486,370	112	430	Gold	Agriculture.	Hardwoods, coffee, tobacco, sugar, coconuts, bananas.
Serbia	2,493,770	18,630	103,573,257	400	2,200	Gold	Agriculture.	Animal products, cereals, fruits.
Siam	7,000,000	220,000	19,496,000	650	3,000	Gold	Agriculture.	Rice, teakwood, pepper, fish.
Spain	18,891,574	194,783	1,817,674,327	9,020	22,256	Gold	Agriculture.	Wine, cereals, textiles, iron, coal, copper.
Spanish Africa	273,700	253,580	.....	.....	.....	.....	.....	.....
Spanish Islands	127,172	1,957	.....	.....	.....	.....	.....	.....
Sweden	3,294,885	172,876	138,120,699	8,458	19,924	Gold	Agriculture and mining.	Timber, iron, butter, cereals.
Switzerland	3,316,443	15,976	527,400,448	3,200	8,500	.....	Agriculture and manu- facturing.	Textiles, silk, clocks, watch- es, food products.
Turkish Empire	41,049,720	1,622,080	527,963,636	4,075	26,890	Gold	Agriculture.	Tobacco, cereals, coffee, wine, silk, fruits.
European Turkey	6,130,200	65,350	.....	.....	.....	.....	.....	.....
Anatolia Turkey	17,083,500	693,610	.....	.....	.....	.....	.....	.....
Asia Minor	1,000,000	300,000	.....	.....	.....	.....	.....	.....
Egypt	9,821,100	600,000	463,854,243	.....	.....	.....	.....	.....
United States	91,972,266	3,616,484	1,023,861,531	236,969	273,796	Gold	Agriculture, mining and manufacturing.	Corn, tobacco, cotton, coal, petroleum, iron, copper, structural steel, agricul- tural machinery, textiles, sugar, gold, silver.
United States and Islands	103,992,737	3,756,884	.....	.....	.....	.....	.....	.....
Philippines	7,635,426	122,000	16,000,000	.....	.....	.....	.....	.....
Porto Rico	1,118,012	3,606	.....	.....	.....	.....	.....	.....
Alawai	154,001	6,449	.....	.....	.....	.....	.....	.....
Tutula, Samoa	5,900	54	.....	.....	.....	.....	.....	.....
Guam	8,661	200	.....	.....	.....	.....	.....	.....
Uruguay	1,111,738	73,210	134,682,430	1,380	4,943	Gold	Agriculture and grazing.	Wool, hides, skins, meat products.
Venezuela	2,561,000	593,940	35,710,303	502	4,552	Gold	Agriculture and forest products.	Hardwoods, coffee, cocoa, cattle.

## NOTABLE FOREIGN CITIES

Cities and Country	Census Year	Population	Cities and Country	Census Year	Population	Cities and Country	Census Year	Population
Aachen (Fr. Aix-la-Chapelle), Germany.....	1905	144,095	Baku, Russia.....	1900	179,133	Bombay (Hind. Bombay), India.....	1906	977,822
Abokuta, West Africa.....	.....	150,000	Bangkok, India.....	1901	159,040	Bonn, Germany.....	1908	81,997
Aberdeen, Scotland.....	est. 1907	174,579	Barcelona, Spain.....	1900	333,000	Bordeaux, France.....	est. 1907	67,114
Adana, Turkey in Asia.....	1905	100,000	Barcellona, Italy.....	1901	121,208	Berlin, Germany.....	1906	1,250,000
Adelaide, Australia.....	1906	174,438	Barfleur, Persia.....	est. 1900	60,000	Bordeaux, France.....	1906	251,947
Adrianople, Turkey.....	est. 1900	81,000	Bari, Italy.....	1906	77,478	Bournemouth, England.....	est. 1907	60,246
Adra, India.....	1901	185,300	Barmen, Germany.....	1906	156,148	Bradford, England.....	1906	293,546
Ahmedabad, India.....	1901	185,890	Barron, India.....	1901	103,700	Bremen, Germany.....	1905	214,879
Algeria.....	1901	73,859	Batavia, Netherlands.....	est. 1907	61,635	Brescia, Italy.....	1906	70,614
Alexandria (Ar. and Turk. Iskenderiyah), Egypt.....	1907	332,246	Basel, Switzerland.....	1908	120,470	Breil, France.....	1906	470,904
Alicante, Algeria.....	1906	138,210	Batavia, Java.....	1900	116,887	Brighton, England.....	est. 1907	129,023
Aligarh, India.....	1901	70,434	Batavia, Turkey.....	est. 1905	240,180	Brisbane, Australia.....	est. 1906	132,468
Alibabad, India.....	1901	172,012	Belgrade (Serv. Beograd), Serbia.....	1905	80,747	Bristol, England.....	est. 1907	367,979
Alma, Germany.....	1905	108,320	Bellary, India.....	1901	68,247	Brunn (Slov. Brno), Czechoslovakia.....	est. 1901	109,346
Amboina, India.....	1901	96,638	Benares, India.....	1901	209,331	Brunn, Turkey in Asia.....	est. 1906	90,000
Amiens, France.....	1906	114,000	Bergen, Norway.....	1905	80,000	Brussels (Fr. Bruxelles), Belgium.....	1906	623,041
Amritsar, India.....	1901	162,429	Berlin, Germany.....	1908	2,101,935	Bucharest (Rouman. Bucarest), Roumania.....	1902	281,177
Amsterdam, Holland.....	1906	364,186	Bern, Switzerland.....	est. 1905	73,185	Budapest, Hungary.....	1900	732,322
Angers, France.....	1906	82,935	Berthel, Germany.....	1905	60,678	Buenos Ayres, South America.....	est. 1909	1,246,532
Antananarivo, Madagascar.....	est. 1904	70,000	Bhagalpur, India.....	1901	72,760	Bury, England.....	est. 1907	58,918
Antwerp (Fr. Anvers, Sp. Amberes), Belgium.....	1906	304,041	Bhopal, India.....	1901	77,603	Cabul, Afghanistan.....	1900	60,000
Arnhem, Netherlands.....	1906	62,279	Bijskoop, Russia.....	1900	63,927	Cadix, Spain.....	1901	69,382
Astrakhan, Russia in Europe.....	1900	121,580	Blanken, Germany.....	1905	71,790	Calcutta (Ar. Mur-e-Kalra), Egypt.....	1907	654,476
Athens (Gr. Athenai), Greece.....	1905	80,259	Blenheim, England.....	est. 1907	82,596	Calcutta, India.....	1901	1,029,987
Bahia, Brazil.....	1900	170,000	Birmingham, England.....	est. 1907	515,165	Calicut, India.....	1901	76,961
			Blackburn, England.....	1905	184,454			
			Bocum, Germany.....	1905	111,641			
			Bogota, Colombia.....	1905	130,000			
			Bokhar, Germany.....	1904	73,000			
			Bologna, Italy.....	1901	122,009			
			Bolton, England.....	est. 1907	182,917			

*(continued)*

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## LARGEST FOREIGN CITIES—Continued

Cities and Country			Cities and Country			Cities and Country			Cities and Country		
Year	Population		Year	Population		Year	Population		Year	Population	
1903	70,000	Port-au-Prince, Hayti...	1903	68,000	Sasebo, Japan...	1903	68,000	Trichinopoly, India...	1901	104,72	
1903	80,000	Port-au-Prince, Hayti...	1903	71,13	Sasebo, Japan...	1903	68,000	Trivendrum, India...	1901	67,88	
1903	56,000	Port Said, Egypt...	1903	143,040	Scheveningen, Prussia...	1903	143,040	Trivendrum, India...	1901	67,88	
1903	208,291	Portsmouth, England...	1901	61,254	Scheranagar, India...	1901	61,254	Turkistan, Russia...	1897	65,18	
1903	119,267	Portsmouth, England...	1901	100,220	Seoul, Korea...	1901	100,220	Turkistan, Russia...	1897	65,18	
1903	61,414	Portsmouth, England...	1901	196,646	Seoul, Korea...	1901	196,646	Turkistan, Russia...	1897	65,18	
1903	228,645	Prague (Bohem. Praha),	1903	148,315	Seville, Spain...	1903	148,315	Turkistan, Russia...	1897	65,18	
1903	66,867	Prague (Bohem. Praha),	1903	78,418	Shanghai, China...	1903	78,418	Turkistan, Russia...	1897	65,18	
1903	117,098	Prague (Bohem. Praha),	1903	1,000,000	Shanghai, China...	1903	1,000,000	Turkistan, Russia...	1897	65,18	
1903	86,932	Prague (Bohem. Praha),	1903	80,000	Shanghai, China...	1903	80,000	Turkistan, Russia...	1897	65,18	
1903	68,840	Prague (Bohem. Praha),	1903	80,787	Shanghai, China...	1903	80,787	Turkistan, Russia...	1900	212,53	
1903	80,000	Prague (Bohem. Praha),	1901	75,288	Shanghai, China...	1901	75,288	Turkistan, Russia...	1900	61,26	
1903	75,731	Prague (Bohem. Praha),	1903	1,000,000	Shanghai, China...	1903	1,000,000	Turkistan, Russia...	1900	61,26	
1901	234,881	Prague (Bohem. Praha),	1903	228,555	Shanghai, China...	1903	228,555	Turkistan, Russia...	1900	61,26	
1901	64,031	Prague (Bohem. Praha),	1903	87,068	Shanghai, China...	1903	87,068	Turkistan, Russia...	1900	61,26	
1901	87,068	Prague (Bohem. Praha),	1903	201,000	Shanghai, China...	1903	201,000	Turkistan, Russia...	1900	61,26	
1901	80,211	Prague (Bohem. Praha),	1903	82,187	Shanghai, China...	1903	82,187	Turkistan, Russia...	1900	61,26	
1901	58,499	Prague (Bohem. Praha),	1903	113,460	Shanghai, China...	1903	113,460	Turkistan, Russia...	1900	61,26	
1901	73,640	Prague (Bohem. Praha),	1903	70,801	Shanghai, China...	1903	70,801	Turkistan, Russia...	1900	61,26	
1901	66,292	Prague (Bohem. Praha),	1903	224,119	Shanghai, China...	1903	224,119	Turkistan, Russia...	1900	61,26	
1901	124,859	Prague (Bohem. Praha),	1903	822,738	Shanghai, China...	1903	822,738	Turkistan, Russia...	1900	61,26	
1901	282,943	Prague (Bohem. Praha),	1903	100,000	Shanghai, China...	1903	100,000	Turkistan, Russia...	1900	61,26	
1901	124,859	Prague (Bohem. Praha),	1903	204,443	Shanghai, China...	1903	204,443	Turkistan, Russia...	1900	61,26	
1901	282,943	Prague (Bohem. Praha),	1903	600,000	Shanghai, China...	1903	600,000	Turkistan, Russia...	1900	61,26	
1901	133,650	Prague (Bohem. Praha),	1903	158,029	Shanghai, China...	1903	158,029	Turkistan, Russia...	1900	61,26	
1901	87,999	Prague (Bohem. Praha),	1903	149,944	Shanghai, China...	1903	149,944	Turkistan, Russia...	1900	61,26	
1901	803,537	Prague (Bohem. Praha),	1903	109,400	Shanghai, China...	1903	109,400	Turkistan, Russia...	1900	61,26	
1906	150,000	Prague (Bohem. Praha),	1903	119,306	Shanghai, China...	1903	119,306	Turkistan, Russia...	1900	61,26	
1906	60,790	Prague (Bohem. Praha),	1903	97,274	Shanghai, China...	1903	97,274	Turkistan, Russia...	1900	61,26	
1906	119,476	Prague (Bohem. Praha),	1903	60,000	Shanghai, China...	1903	60,000	Turkistan, Russia...	1900	61,26	
1906	390,364	Prague (Bohem. Praha),	1903	629,600	Shanghai, China...	1903	629,600	Turkistan, Russia...	1900	61,26	
1906	121,000	Prague (Bohem. Praha),	1903	629,600	Shanghai, China...	1903	629,600	Turkistan, Russia...	1900	61,26	
1906	118,459	Prague (Bohem. Praha),	1903	200,000	Shanghai, China...	1903	200,000	Turkistan, Russia...	1900	61,26	
1906	64,790	Prague (Bohem. Praha),	1901	87,870	Shanghai, China...	1901	87,870	Turkistan, Russia...	1900	61,26	
1906	60,000	Prague (Bohem. Praha),	1901	60,723	Shanghai, China...	1901	60,723	Turkistan, Russia...	1900	61,26	
1906	92,476	Prague (Bohem. Praha),	1901	158,673	Shanghai, China...	1901	158,673	Turkistan, Russia...	1900	61,26	
1907	1,678,000	Prague (Bohem. Praha),	1901	280,000	Shanghai, China...	1901	280,000	Turkistan, Russia...	1900	61,26	
1907	70,621	Prague (Bohem. Praha),	1901	750,000	Shanghai, China...	1901	750,000	Turkistan, Russia...	1900	61,26	
1907	236,670	Prague (Bohem. Praha),	1901	189,050	Shanghai, China...	1901	189,050	Turkistan, Russia...	1900	61,26	
1907	80,909	Prague (Bohem. Praha),	1901	63,700	Shanghai, China...	1901	63,700	Turkistan, Russia...	1900	61,26	
1907	89,296	Prague (Bohem. Praha),	1901	2,196,079	Shanghai, China...	1901	2,196,079	Turkistan, Russia...	1900	61,26	
1907	58,194	Prague (Bohem. Praha),	1901	65,533	Shanghai, China...	1901	65,533	Turkistan, Russia...	1900	61,26	
1907	61,019	Prague (Bohem. Praha),	1901	208,000	Shanghai, China...	1901	208,000	Turkistan, Russia...	1900	61,26	
1907	90,118	Prague (Bohem. Praha),	1901	116,282	Shanghai, China...	1901	116,282	Turkistan, Russia...	1900	61,26	
1907	137,147	Prague (Bohem. Praha),	1901	103,349	Shanghai, China...	1901	103,349	Turkistan, Russia...	1900	61,26	
1907	90,118	Prague (Bohem. Praha),	1901	719,438	Shanghai, China...	1901	719,438	Turkistan, Russia...	1900	61,26	
1907	137,147	Prague (Bohem. Praha),	1901	81,671	Shanghai, China...	1901	81,671	Turkistan, Russia...	1900	61,26	
1907	90,118	Prague (Bohem. Praha),	1901	70,725	Shanghai, China...	1901	70,725	Turkistan, Russia...	1900	61,26	
1907	137,147	Prague (Bohem. Praha),	1901	56,275	Shanghai, China...	1901	56,275	Turkistan, Russia...	1900	61,26	

**FAMOUS RIVERS, LAKES, ISLANDS, MOUNTAINS, VOLCANOES AND WATERFALLS**

### Islands, Most Noted in the World

	Area Square Miles	Population	Name	Location	Height (Feet)	Name	Location	Height (Feet)
Borneo.....	284,840	2,000,000	Arenagus.....	Chili.....	23,083	McKinley.....	Alaska.....	20,464
Ceylon.....	71,479	1,500,000	Arafat.....	Arabia.....	14,279	Macondo.....	Colombia.....	14,999
Ceylon.....	25,332	357,333	Arequipa.....	Peru.....	20,230	Marcy, Mt.....	New York.....	20,335
Cuba.....	44,164	368,000	Asuncion.....	South America.....	4,640	McKinley.....	Colombia.....	14,999
Great Britain.....	29,699	7,722,000	Black Mountain.....	Alaska.....	10,900	Matterhorn.....	Switzerland.....	14,624
Greenland.....	816,000	11,895	Blackburn.....	Alaska.....	10,900	Mercedario.....	Argentina.....	22,231
Hainan.....	11,000	1,000,000	Blackburn.....	Alaska.....	10,900	Mercedario.....	Argentina.....	22,231
Hainan.....	87,485	37,413,411	Brown, Mt.....	Canada.....	10,900	Millin, Mt.....	Norwege.....	11,740
Iceland.....	78,470	309,756	Cebu, Mt.....	France.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
India.....	4,458,000	309,756	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Java and Madura.....	50,554	30,098,008	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Luzon, Philippines.....	40,969	3,798,507	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Madagascar.....	222,430	2,222,430	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Madagascar.....	42,734	217,637	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Newfoundland.....	81,313	709,000	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
New Guinea.....	77,408	1,000,000	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
New Zealand, North Island.....	56,525	141,230	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
New Zealand, South Island.....	56,525	141,230	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Tasmania.....	26,245	17,430	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Sumatra, East Indies.....	20,000	2,000,000	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Saskatchewan.....	29,000	28,113	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Saskatchewan.....	4,000	100,000	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611
Yezo.....	30,143	922,058	Chin, Mt.....	China.....	11,735	Mount Mitchell, Mt.....	North Carolina.....	6,611

### Mountains, Not Noted in the World

[illegible]

## GREAT RIVERS, LAKES, ISLANDS, MOUNTAINS, VOLCANOES AND WATERFALLS—Continued

Mountains—Continued			Rivers—Continued			Volcanoes—Continued		
Name	Location	Height (feet)	Name	Length	Height (feet)	Name	Location	Height (feet)
Washington, Mt.	New Hampshire	6,279	Rhine	960		San José	Chile	20,220
Wheeler Peak	Nevada	13,058	Rhone	550		St. Elias, Mt.	Alaska	18,284
Windy	California	14,502	Rio de la Plata	2,950		St. Helena, Mt.	United States	10,000
Williamson	California	14,500	Rio Grande	1,809		Stromboli	Islands	2,000
Wraggle, Mt.	Alaska	17,500	Rio Negro	1,650		Tahiti, Peak of	Friendly Islands	2,400
Yamfield	Norway	8,543	San Francisco	1,680		Tenerife	Canary Islands	12,000
Rivers, Most Noted of the World			Sanktichewan	1,918		Tollima	Colombia	18,000
Name	Length		Seine	497		Toluca	Mexico	14,500
Amazon	3,300		St. Lawrence	1,030		Vesuvius	Italy	4,260
Amaru	1,500		St. Lawrence	1,030		Waterfalls, Greatest of the World		
Arkanian	2,170		Volga	2,900		Name	Location	Height (feet)
Brahmaputra	2,000		Ural	1,099		Bridal Veil	California	900
Camero	2,400		Volga	508		Foyers	Great Britain	205
Colorado	2,000		Volga	508		Great Falls	Montana	500
Columbia	1,400		Yangtze	3,000		Gavarré	Pyrenees	1,400
Congo	2,900		Yenisei	3,322		Grand Falls	Labrador	2,900
Danube	1,800		Yukon	2,000		Great Falls	Montana	500
Delceper	1,200		Zambesi	1,800		Hay River	Alaska	200
Don	1,104		Volcanoes, Greatest of the World			Haleteur Falls	Guiana	740
Elbe	700		Name	Location	Height (feet)	Harbin Falls	Austria	1,500
Esprades	550		Altar	Leander	17,710	Hukonam Fall	Guiana	1,500
Ganges	1,500		Antianha	Leander	19,335	Manatran	Norway	940
Hoang-Ho	2,700		Cajama	Leander	19,335	Nevada Falls	California	600
Indus	2,600		Cotopaxi	Leander	18,880	Niagara	New York	165
Irrawadi	2,532		Demarand	Perma	18,500	Oroca Falls	Monte Rosa	2,400
Kongo	2,900		Eden	Eden	18,500	Rjukanfoss	Norway	991
Leander	598		Fujiyama	Japan	12,390	Rosalia Fall	Guiana	2,000
MacKenzie	2,400		Hecla	Iceland	8,110	Rukafoss	Norway	513
Meander	1,300		Hopetoun	England	12,553	Schubert	Iceland	500
Missouri and Mississippi	4,200		Irtashunt	Mexico	10,076	Skyjefoss	Norway	700
Murray	3,000		Luialaba	Chili	21,000	Staubach	Switzerland	1,600
Nile	2,500		Makindu	Hawaii	13,600	Sutherland Falls	New Zealand	1,904
Niger	3,500		Mauka Loa	Hawaii	13,600	Tequendama	Colombia	475
Ohio	2,700		Milil	Peru	20,015	Terna Falls	Austria	841
Ohio and Allegheny	1,400		Peice	Marinique, W.I.	4,300	Yelline Falls	Italy	991
Orange	1,152		Piro, Frak of	Andres	7,013	Vermafos	Norway	964
Orinoco	1,500		Popocatepetl	Mexico	17,718	Vettifoss	Iceland	853
Parana	2,211		Sahama	Peru	23,000	Victoria Falls	Zimbabwe	300
Red River	1,600		Sangal	Leander	17,459	Yosemite	Norway	500
						Yosemite	California	2,660

## COUNTRIES OF THE WORLD AND THEIR CHIEF DEPENDENCIES

**Abyssinia.**—A country of North Africa, occupying a highland region southwest of the Red Sea. The country is made up of a number of states, the chief of which are Tigre in the north, Amhara in the west and Galla, and Shoa, in the south.

**Surface.**—It consists mainly of a huge table-land with a mean elevation of 7,000 feet. The declivity to the bordering tract on the Red Sea is abrupt; toward the Nile behind it is gradual. The main mass has been cut into a number of island-like sections by the streams, which have worn their channel into ravines of vast depth—as much sometimes as 4,000 feet. Isolated mountains, with naked perpendicular sides, present the most singular forms. The Samen mountains have summits rising to the height of 15,000 feet.

**Rivers.**—The principal are the head-streams of the Blue Nile, issuing from the great Lake Tanna, Tana, or Dembea, and the Atbara, also a tributary of the Nile; less important are the Marsh and the Hawak.

**Climate and Vegetation.**—The climate, notwithstanding its tropical position, is on the whole moderate and pleasant owing to its elevation, though in the river valleys and swamps the heat and moisture are suffocating and pestilential. As a whole, the country is exceedingly fruitful; and its productions are of the most varied nature, from the banana, fig, and lichen of North Europe to the choicest tropical plants. Two, and in some places three, crops can be raised in one year.

**Animals.**—The larger animals are lions, panthers, elephants, rhinoceroses, hippopotamuses, muses, jackals, hyaenas, bears, numerous antelopes, monkeys, and crocodiles.

**People.**—The population consists of various tribes, the chief of the Abyssinians proper—brown, well-formed people, belonging to the Semitic stock. The basis of the language is the ancient Ethiopic (see Ethiopia) or Ge'ez, a Semitic language which is now the sacred language. The modern dialect of Amhara is the prevalent language of the country. There are Galla and Somalis in the south and southeast. The Falashas are of Jewish origin, and still retain many of their racial peculiarities.

**Towns.**—The towns are small—Addis Ababa, capital of Shoa and of Abyssinia; Gondar,

in Amhara; Adowa, or Adua, in Tigre; Axum, the old capital—not to speak of Harar, lately annexed. Any foreign trade comes mainly through Massowah. The religion of the Abyssinians proper is a debased Christianity; but the Galla and other alien tribes are nearly Mohammedans.

**Afghanistan.**—An inland country of Asia, forms the northeastern portion of the great Iran plateau. Its breadth is about 500 miles, and its length, from the Hindustan boundary to the Khashiir, about 600 miles. It is bounded on the east by the tribes on the northwest frontier of India under British control; on the south by Baluchistan; on the west by Persia; on the north by the Russian central Asian states. Cabul is the capital.

**Surface.**—Afghanistan consists chiefly of lofty, bare, uninhabited table-lands, sandy barren plain, ranges of snow-covered mountains, offsets of the Hindu Kush or the Himalayas, and deep ravines and valleys. Many of the last are well watered and very fertile, but about four-fifths of the whole surface is rocky, mountainous and unproductive. The surface on the northeast is covered with lofty ranges belonging to the Hindu Kush, whose peaks are often 18,000 or sometimes 20,000 feet. The whole northeastern portion of the country has a general elevation of over 6,000 feet, but toward the southwest the declivity is gradual. The principal mountain chains of the interior rise, the general elevation declines to not more than 1,600 feet. In the interior the mountains sometimes reach the height of 15,000 feet. A great part of the frontier toward India consists of the Sulaiman range, 12,000 feet high.

There are numerous practicable avenues of communication between Afghanistan and India, the most important being the famous Khyber pass, by which the river Kabul enters the Punjab; the Gomul pass, also leading to the Punjab; and the Bolan pass on the south, through which the route passes to Sind.

**Rivers.**—Of the rivers the largest is the Helmand, which flows in a southwesterly direction more than 400 miles, till it enters the Hamoon or Arabian swamp. It receives the Arghandab, a considerable stream. Next in importance are the Kabul in the northeast, which drains to the Indus, and the Hari Rud in

the northwest, which, like other Afghanistean streams, runs itself in the sand.

**Climate and Vegetation.**—The climate is extremely cold in the higher, and intensely hot in the lower regions, yet on the whole it is salubrious. The most common trees are pines, oaks, birch, and walnut. In the valleys fruits, in the greatest variety and abundance, grow wild.

**Animals.**—The chief domestic animals are the dromedary, the horse, ass, and mule, the ox, sheep with large fine fleeces and enormous fat tails, and goats; of wild animals there are the tiger, bears, leopards, wolves, jackal, hyaenas, foxes, etc.

**People.**—The population is very mixed. The Afghans (or Duranis) have been predominant since 1747, especially in Kandahar; next come the Ghilzai (military and commercial) and the Tajiks (aboriginals, who are cultivators or retail traders). All are Sunni Mohammedans, except the Hasaras and Kishlathies, who belong to the Shiite sect. The national tongue is Pushtu.

**Towns.**—The chief towns are Cabul (the capital), Kandahar, Ghuzni, and Herat.

**Argentine Republic.**—A vast country of South America, the chief of which is 2,300 miles, and the average breadth a little over 500 miles, the total area reaching 1,135,840 square miles. It is bounded on the north by Bolivia, on the east by Paraguay, Brazil, Uruguay, and the Atlantic, on the south by the Antarctic Ocean; and on the west by the Andes. The republic is made up of fourteen provinces and a number of territories. On the west, the Andes divide this republic from Chili; Bolivia bounds the country on the north, while Paraguay, Brazil, Uruguay, and the Atlantic Ocean form the eastern limit. The great island-group of Fuegia, on the south, belongs partly to this republic and partly to Chili.

**Surface and Vegetation.**—Except for the sub-Andean America, the country is a few other low and unimportant hilly or mountainous tracts, nearly all the country consists of vast plains or pampas. The northern plain region (the Chaco) is in part desert; but most of the pampa country is open, presenting wide ranges of treeless pasture, varied by patches of huge thistles and other coarse plants. In the Patagonian region

there are extensive districts interspersed with clumps of thorny brushwood, and baying in the hollows many strongly saline ponds or lakes.

**Animals.**—The native fauna includes the puma, the jaguar, the large feline, the alpaca, the vicuña, armadillo, the rheu or marmot (a species of ostrich), etc.

**Rivers.**—The greater part of the republic is well watered and highly fertile, but there are extensive regions of waste land. The rivers Paraná and Uruguay, with their large tributaries, are important channels of trade.

**Climate.**—The climate in the extreme north is very hot, for it lies south of the tropic of Capricorn. The more remote southern territories have an extremely bleak, windy, and disagreeable climate, but are not really so cold as might be expected from their relatively high latitude. But the country in general enjoys an equable, temperate, and healthful climate.

**People.**—The people of the country are mostly Spanish in their language and descent, although there are many Italians, French, and other European immigrants. The Gauchos are a race of half-bred cattle-rearers and horse-breakers; they are continually on horse-back, following over the plains, collecting their herds and droves, taming wild horses, or catching and slaughtering cattle. In such occupations they acquire a marvelous dexterity in the use of the lasso and bolas.

**Cities.**—The principal seaport is Buenos Ayres, the capital and largest city. Among the other large towns are Cordoba, Rosario, La Plata, Mendoza, Tucuman, Corrientes, Salta, and Santa Fé.

**Australia.**—The smallest of the continents, the largest among the islands of the world. Extends 2,500 miles from west to east, 1,970 miles from north to south, and its coast line has a development of 10,629 miles (exclusive of all minor bays). The commonwealth of Australia was formed in 1901, and consists of the six original states of New South Wales, Victoria, Queensland, South Australia, West Australia, and Tasmania. Most of the coast is barren and uninviting. Inlets and natural harbors abound only in the east, southeast, and northwest. The southern portion, for a distance of 1,400 miles, is fringed by coral reefs.

**Surface.**—The great dividing range runs along the east coast, rising to a height of 7,336 feet. The greater part of the interior consists of a table-land of moderate elevation, either barren or fit only for pasturage. The great lowland plains are those of the Murray valley and of Lake Eyre, supposed to be below the level of the sea.

**Rivers.**—The Murray, draining an area of 275,000 square miles, is the only river of importance, but even it is navigable only during part of the year.

**Climate.**—Tropical in the north, temperate in the south. An annual rainfall of over twenty-five inches is experienced only along the southeast, east, and north coasts, and in a small district in the southwest. In the bulk of the interior the annual rainfall is less than ten inches.

**Animal and Vegetable Life.**—When discovered there were neither carnivorous animals (except the dingoo) nor ruminants. Pouched animals (such as the kangaroo), cockatoos, the emu, and birds of paradise, are most characteristic of the continent. The vegetation is equally peculiar, the principal trees being Eucalypti (gum trees, gum trees, iron bark, etc.), acacias, and eucalyptus (oaks). The woods are confined to regions of heavier rainfall. Much of the interior is an open grass-land with scattered trees, degenerating in the more and parts into a veritable desert.

**Cities.**—The largest cities are Melbourne, capital of Victoria; Sydney, of New South Wales; Adelaide, of South Australia; Brisbane, of Queensland; and Ballarat, and Sandhurst in Victoria.

**People.**—The population is almost all of European origin, the predominating element being British. The British-born are no longer the most numerous element in the colonial populations, the native-born being

now over three-fourths. Chinese and Germans number about 30,000 and 38,500 respectively; there are many Polyynesians (Kanakas) in Queensland; also many Scandinavians, Americans, and French.

**Austria** is the usual name of the great empire now called the Austro-Hungarian monarchy. Since 1867 the empire is composed of a union of two states under one emperor, but administratively distinct. The one is Austria, the other Hungary and the Bohemian crown lands. The Austrian dominions form geographically a compact territory, with a circumference of about 5,350 miles. The total area is greater than that of any other European state save Russia, and is nearly twice the area of the United Kingdom. The body of the empire lies in the interior of Europe, though it has about 600 miles of sea-coast on the Adriatic.

**Bosnia-Herzegovina**, which had since the treaty of Berlin in 1878 been occupied and administered by Austria-Hungary, was in 1908 formally annexed to the empire.

**Surface.**—Three-fourths of Austria is mountainous or hilly, being traversed by three great mountain chains, the Alps, the Carpathians, and Sudetes, whose chief ridges are of primitive rock. The Rhetian and Noric Alps stretch from Switzerland to the Danube, and contain the highest points of the Austrian territories, the Ortler Spitze rising to 12,514 feet.

The Carpathian chain, extending for 880 miles, rises on the left bank of the Danube, near Presburg, and, sweeping in a curve, first east, and then southward through Transylvania, again meets the Danube; it culminates at 8,517 feet.

The Sudetes run through the northeast of Moravia and Bohemia, in which last the range is known as the Riesengebirge, or Giant mountains. Continuous with this range, but beginning on the left bank of the Oder, is the Riesengebirge, or Giant mountains, on the confines of Saxony. The chief plains of the Austrian empire are the vast lowlands of Hungary and the plain of Galicia.

**Lakes and Rivers.**—The chief lakes are Lake Neusiedler, 392 square miles, and the Neusiedler See, both in Hungary; and remarkable is also the Zirknitz Lake in Illyria.

The leading rivers are the Danube, which has a course of 680 miles within the Austrian dominions; its navigable affluents being the Inn, Save, Drave, March, Waag, and the Theiss, which drains nearly half of Hungary; the Vistula, with its tributary, the Bug; the Elbe, with the Moldau and Eger; the Danube and Adige.

The climate of Austria varies much on account of the extent and diversity of the surface.

**Cities.**—The most important cities are the capital, Vienna, and seven other towns above 100,000—Budapest, Prague, Trieste, Lemberg, Gratz, Brünn and Szegeid. Thirteen others have above 50,000.

**People.**—More than half of the European states except Russia exhibit such a diversity of race and language as the Austrian empire.

The Slavs—who differ greatly, however, among themselves in language and civilization—amount to 46 per cent. of the total population, and form the great mass of the population of Bohemia, Moravia, Carniola, Galicia, Dalmatia, Croatia, Slavonia, northern Hungary, and half the population of Serbia and Bukovina.

The Germans form almost the sole population of Austria, Salzburg, the greatest portion of Styria and Carinthia, almost the whole of Tyrol and Vorarlberg, large portions of Bohemia and Moravia, the whole of West Silesia, etc.; and they are also numerous in Hungary and Transylvania.

Of the Magyar or Hungarian, form nearly half of the inhabitants of the kingdom of Hungary and the connected provinces.

Of the Italic or western Romanic stock there are about 750,000, and of the Roumanian or eastern Romanic stock. The number of Jews is above 2,000,000; and there are other races, such as the gypsies (1,500,000), who are most numerous in Hungary and Transyl-

vania, and the Albanians in Dalmatia and the adjacent parts.

**Belgium** is one of the smaller European states, and consists of the southern portion of the former kingdom of the Netherlands, lying between France and Holland, the North Sea and the Rhine. Its greatest length from northwest to southeast is 173 miles; and its greatest breadth from north to south 105 miles. There are nine provinces—Antwerp, West Flanders, East Flanders, Hainaut, Liège, Brabant, Limburg, Luxembourg, and Namur, of which Luxembourg is the largest and Limburg the smallest.

**Surface.**—It is, on the whole, a level, and even the lying country; diversified, however, by hilly districts. In the southeast, a western branch of the Ardennes highlands separates the basin of the Meuse from that of the Moselle. The fertile Campine, composed of marshes and barren heaths, extends along the Dutch frontier. In Flanders dikes have been raised to check the encroachments of the sea.

**Rivers.**—The abundant water-system of Belgium is chiefly supplied by the great navigable rivers, the Scheldt, the Meuse, and the Rhine, which run in France, and have their mouths in Holland. These rivers have numerous and important tributaries, and there are some forty canals.

**Cities.**—Brussels, the capital, is, with its suburbs, the largest city; Antwerp is its second. Liège and Ghent have more than 50,000 inhabitants; and there are twenty other towns with over 20,000.

**People.**—The population of Belgium is of partly Germanic, partly Celtic origin. The Flemings (Flemish stock) and Walloons (Celtic in origin) speak each their own dialects of Dutch and French; there are also numbers of Germans, Dutch, and French. East and West Flanders, Antwerp, and Brabant are almost wholly Flemish; and Brussels mainly so. The French language has gained the ascendancy in educated society and in the offices of the government; but the Flemish is prevalent commercially in the proportion of nine to eight.

**Bolivia** is situated on the west side of South America, and formed till 1825 part of the vice-royalty of Buenos Ayres. It is included by Brazil, Peru, Paraguay, Chile, and Uruguay, and Chili. Bolivia lost its coast provinces to Chili through the war carried on by Bolivia and Peru against Chili in 1879.

**Surface.**—Bolivia contains the greater part of the loftiest and most mountainous district of America, as comprising a section of the Andes system at its broadest extension. The lofty plateau of Oruro, with an average height of 13,000 feet, and about 150 miles broad, is inclosed between the Andes proper (now the western boundary of Bolivia), and the Cordillera Real, to the east. There are also intermediate ranges and isolated groups of the volcanoes, all the western region. Sahama, Illimpu, and Illimani, are over 21,000 feet high.

The great Cordillera falls into two parts, of which the northern is the more inhabited, as containing the lake of Titicaca and many well-watered valleys around it. The southern and lower table-land is chiefly a desert.

The Cordillera Real system descends abruptly, on the north, to the plain of the Amazon; but its eastern edge is a series of terraces, sinking gently to the plains of eastern Bolivia. The eastern terraces, between 9,000 and 11,000 feet, have a temperate climate, and wheat and corn are produced; in those between 5,000 and 9,500 feet, tropical fruits flourish.

**Climate and Vegetation.**—Although situated entirely within the tropics, Bolivia, from its varied elevation, possesses a wide range of climate and vegetation. In the *punas* (over 11,000 feet high) the climate is cold and dry, and the vegetation scanty. The valleys of the eastern terraces, between 9,000 and 11,000 feet, have a temperate climate, and wheat and corn are produced; in those between 5,000 and 9,500 feet, tropical fruits flourish.

East of the inner cordillera lie the plains under the 5,000-foot limit. This district, with its numerous streams, its luxuriant tropical vegetation, its rich forests of valuable trees in the north, and its immense open

savannas in the south, surpasses most countries of South America in fertility and resources.

**Lakes.**—The waters of Lake Titicaca are conveyed to Lake Aullaga by the Desaguadero. The latter lake (which is salt) has only an insignificant outlet.

**People.**—The population of Bolivia is a mixture of half-caste Spaniards and Indians, and a few negroes. The Indians are partly civilized (Quechuas and Aymaras), partly semicivilized (Chiquitos and Moxos), and partly wild.

**Brazil, United States of,** occupies nearly half of the continent of South America. Greatest length, east to west, 2,630 miles; greatest length, north to south, 2,540 miles; with an area about one-sixth smaller than Europe. It is bounded southeast, east, and north-east by the Atlantic Ocean, north by French, Dutch, and British Guiana, and Venezuela; west and southwest by Ecuador, Peru, Bolivia, Paraguay, the Argentine republic, and the republic of Uruguay. Brazil is divided into a federal district, twenty states, many of them larger than Great Britain, and a territory.

**Surface.**—There are three regions—1. The Brazilian highlands in the southwest, rising boldly from the coast, and culminating in the Itatiaiy, 8,200 feet. The western slopes well wooded; in the interior extensive caupias. 2. The great forests of the Amazonas in the northwest. 3. The lowlands on the upper Paraguay and the uplands region of Matto Grosso in the west.

**Rivers.**—Brazil possesses three great river-systems—the Amazon, La Plata, and San Francisco. The Amazon and its tributaries drain fully a half of the country. To the east of the Madeira these tributaries are table-land rivers, broken by rapids and freely navigable for comparatively short distances. West of the Madeira they are lowland rivers, sluggish, bordered by extensive flood-plains, and afford free navigation for long distances. The La Plata system drains nearly one-fifth of the country through its three branches—the Paraguay, Paraná, and Uruguay. The first of these is a lowland river, freely navigable for a long distance, while the other two are table-land rivers, with numerous obstructions and without free outlets for their upper-level navigation.

The San Francisco is a table-land river, flowing northeast between the Serra and Maritime mountains, and then, breaking through the latter, southeast to the Atlantic. It is not freely navigable because of the Paulo Afonso falls.

The other coast rivers are generally short. **Climate.**—The climate of Brazil varies greatly—the lowlands of the Amazon and a great part of the coast being hot, humid, and unhealthy, while the table-lands and some districts of the coast except the trade winds are temperate and healthy.

**Vegetable and Animal Life.**—The vegetation of Brazil is luxuriant and varied. The vast forests of the Amazon contain hundreds of species of trees, draped and festooned by climbing plants, lianas, orchids, etc. Rose-wood, Brazil-wood, and others supply valuable timber; while tropical fruits are abundant.

The number of species of animals is also very large, but the individuals in each are comparatively few. Beasts of prey are the jaguar, puma, tiger-cat, and ocelot; the smaller animals include the monkey, tapir, capybara, peccary, ant-eater, sloth, and boa-constrictor. Alligators, turtles, porpoises, and manatees swarm in the Amazon; and among birds the parrots and humming-birds are especially numerous.

**Cities.**—The chief cities above 75,000 are Rio de Janeiro, Bahia, Pernambuco (or Recife) Sao Paulo, Para, and Porto Alegre.

**People.**—The population of Brazil consists of Brazilians, Indians, and a small number of mixed blood. The native Brazilians, mostly descendants of the Portuguese settlers, but often with a mixture of Indian or African blood, are said to be greatly wanting in energy. The white population, which is, perhaps, a

third of the whole, has in recent years been increased by Italian, Portuguese, and German immigrants.

The negroes are over 2,000,000 in number, and till 1888 were partly slaves. Of the Indians some are semicivilized, but others (estimated at 600,000) roam about in a wild state, and are divided into a great many tribes, speaking different languages.

The state language is Portuguese.

**Bulgaria** is situated in the Balkan peninsula, between the Danube and the Balkans. It was created by the treaty of Berlin in 1878, and since 1885 eastern Roumelia, lying to the south, has been practically incorporated with it.

**Surface and Drainage.**—The physical aspects of eastern Roumelia are varied, the surface in the west being broken up by the foothills of the Albanian ranges, and in the north and northeast by the Balkans and their spurs. The north of Bulgaria is a fertile plain and hilly country; the south is wooded and mountainous. A fine waterway on the northern boundary affords an outlet to the Black Sea.

**Cities.**—Sofia is the capital, the other principal towns being Varna, Shumen, Rustchuk, Widin, Rasgrad, Sistova, Tirnova, and Plevna; Philippopolis is the chief port.

**People.**—Over three-fourths are Bulgarians, 300,000 Turks, 60,000 gypsies, 100,000 Roumanians, 70,000 Greeks, and 34,000 Jews.

**Canada.**—The Dominion of Canada consists of the upper portion of the North American continent except part of Labrador, which belongs to Newfoundland, and Alaska, which belongs to the United States. It includes the various provinces of North America formerly known as Upper and Lower Canada (now Ontario and Quebec respectively), New Brunswick, Nova Scotia, Prince Edward Island, British Columbia, and the territories of the Hudson Bay company, now styled Manitoba, Saskatchewan, Alberta, the Northwest territories, and the Yukon.

**Surface.**—The most striking physical features of Canada are the Rocky mountains, the Laurentian range (which forms the watershed between Hudson Bay and the St. Lawrence, and varies in height from 1,600 to 3,000 feet), and the chain of Great Lakes. The eastern portions of Canada are generally well timbered, as are also British Columbia and the Northwest territories north of the Saskatchewan. Westward of the Red river, between the 40th and 55th parallels of latitude, there is an immense fertile plain, suitable for general agriculture and grazing (the eastern end being about 100 feet above the level of the sea), extending nearly to the Rocky mountains. This range consists of triple chains with valleys between; the most easterly has the greatest elevation near the 52d parallel, the highest peaks being Mount Brown (16,000 feet), Mount Murchison (15,789 feet), and Mount Hooker (14,702 feet). The average height of the chain is from 7,000 to 8,000 feet.

**Rivers and Lakes.**—Canada is well watered, the map presenting a network of lakes and rivers. The system of the St. Lawrence, with the great lakes Superior, Huron, Michigan, Erie, and Ontario, drains an area in Canada of 330,000 square miles. With their outlet the lakes form the greatest fresh-water way in the world. Other important lakes are Winnipeg, Winnipegosis, Manitoba, Lake of the Woods, Great Slave, Great Bear, and Athabasca.

Other rivers are the Saskatchewan and the Winnipeg, flowing into Lake Winnipeg; and the Nelson, flowing from it into Hudson Bay; the Assiniboine and the Red river, which flow in the Lake Winnipeg; the Assiniboine and the Churchill, emptying into Hudson Bay; the Athabasca and the Peace rivers, flowing into Lake Athabasca, and the Slave river, from it into Great Slave Lake; the Mackenzie, fed from both the Great Slave and the Great Bear lakes, and emptying into the Arctic Ocean; the Fraser and Thompson, in British Columbia, emptying into the Pacific; the Columbia and the Sacramento, emptying into the St. Lawrence; and the St. John, in New

Brunswick, which it partly separates from the state of Maine.

**Climate.**—The cold in winter and the heat in summer are frequently extreme, but the climate is a healthy one. The winter may be said to continue from the middle of November to the end of March, although the average of half months. British Columbia and probably possesses the finest climate in North America.

**Cities.**—The chief towns are Montreal, Toronto, Quebec, Ottawa (the capital of the Dominion), Hamilton, Winnipeg, Halifax, and St. John.

**People.**—The nationality of the inhabitants is varied. Ontario is settled principally by emigrants from Great Britain and their descendants, with considerable numbers of Germans and Americans. In the province of Quebec the people are mostly French in origin, speech, and customs, being mainly descendants of the French colonists who inhabited the region before it became British. There are, besides, the Indian tribes and the Eskimo, the latter in the extreme north. In the Dominion, Quebec, and Manitoba the population is divided into two classes in either language. The French spoken by the *Abolians*, as the French-Canadians are called, is a patois which in many respects resembles the French spoken in the islands more closely than the French of modern Paris.

**Ontario** (formerly called Upper Canada), area, 260,862 square miles; population, 2,182,947; extends across the middle of the River St. Lawrence and the great lakes, and is important as containing the Dominion capital, Ottawa.

**Quebec** (formerly called Lower Canada) lies eastward of Ontario, occupying both banks of the St. Lawrence.

**Nova Scotia**, a province of the Dominion, is a peninsula, and is connected with New Brunswick by a low ferry-bridge, the shortest in the world. New Brunswick is situated in the eastern divide of the continent of North America.

**Manitoba** (formerly called the Red River settlement, and entered the Dominion in 1870. It takes its name from Lake Manitoba, which is situated on the western border of the province.

**British Columbia**, Canada's maritime province on the Pacific, extends from the United States boundary to the Rocky mountains, and is bounded on the east by the province of Alberta.

**Prince Edward Island** lies in St. Lawrence Gulf, north of the Strait of Bellefleur, between New Brunswick and Cape Breton.

**Saskatchewan**, a province proclaimed Sept. 1st, 1905, was carved out of the Northwest Territories. It comprises the eastern half of Athabasca and the greater part of the old territory of Alberta.

**Alberta**, a new province proclaimed Sept. 1st, 1905, was carved out of the Northwest Territories. It includes the former district of Alberta, the western half of Athabasca, and a strip of Assiniboia and Saskatchewan.

**The Northwest Territories** comprise those territories formerly known as Rupert's Land, the Northwestern Territory and the district of Keewatin (except the provinces of Manitoba, Saskatchewan and Alberta, and the Yukon territory), together with all British territories and possessions in North America and all islands adjacent to any such territory, and all islands, rocks, shoals, and lead and its dependencies.

The Yukon Territory was in 1905 constituted a separate territory, and is administered by a commissioner.

**Central America**, a geographical division, including the territory from the Isthmus of Panama to the Isthmus of Tehuantepec, but by political arrangements the limits most generally assigned to it include the five republican states of Guatemala, Honduras, San Salvador, Nicaragua, and Costa Rica, with British Honduras and the Mosquito coast. It thus has Mexico on the northwest, Panama on the southeast, and the Pacific Ocean and Caribbean Sea on either side. Its entire length is about 800 miles, with a breadth varying from between 20 and 30 to 350 miles. It is generally mountainous, contains numerous volcanoes, and on the whole is a rich and fertile, but almost totally undeveloped region.

**Costa Rica**, the most southern state of the republics of Central America; bounded north by Nicaragua, east and north by the Caribbean Sea, and south by Colombia; and south and west by the Pacific.

**Surface.**—The country is intersected diagonally by the primary range or cordillera of the isthmus, which throws off numerous spurs on either side. The principal range contains several lofty and

ances (the highest 11,740 feet) and volcanoes, both active and extinct or dormant.

**Colombia.**—The capital is Bogota. The two established ports are Punta Arenas, on the Pacific side, and Porto Limon, on the Caribbean Sea. The other towns are Caracas, Abaco, and Heredia. **People.**—The inhabitants are chiefly descendants of Spaniards from Galicia. Some negroes and half-breed dwell on the coast, but the interior is about 5,000 civilized and 3,000 uncivilized Indians.

**Guatemala.** A republic of Central America, bounded by Mexico, Belize, the Gulf of Honduras, Honduras, San Salvador, and the Pacific.

**Surface.**—The greater part of Guatemala is mountainous, the highlands having a mean elevation of 7,000 feet above the sea; but the surface presents great variety, with extensive valleys, fertile, and upland valleys—the last notable for their beauty, fertility, and favorable climate. Of the volcanoes, several are active, the most noted is Terrazal Fuego (12,075 feet). Earthquakes are frequent; sulphur and other hot springs are numerous.

**Rivers.**—The state is well watered by numerous streams, none of much importance. There are several lakes, the most important being Dulce, through which a great part of the foreign trade of the state is carried on; Amatitlan, Atitlan, and Yoten.

**Climate.**—The climate, except in the low-lying districts where the temperature ranges from 70° to 90°, may be described as perpetual spring, and is generally healthy, but the hot coast lands on the Pacific are liable to yellow fever.

**Vegetable and Animal Life.**—The forests contain over a hundred kinds of trees, such as mahogany, haricot beans, peas, potatoes, wheat and rice grow in various districts. Other products are coffee (the chief export), sugar, indigo, rubber, tobacco, cotton, hemp, sarsaparilla, and many medicinal plants, bananas, and other fruits.

The fauna includes the jaguar, puma, cougar, coyote, red deer, tapir, porcupine, armadillo, several monkeys, iguanas, turkeys, and snakes. The birds are of great variety and beauty; the national emblem is the superbly colored quetzal.

**Coast.**—The capital is Guatemala la Nueva (New Guatemala), on the Bay of Amatique, on the Pacific; Champereon, on the Pacific, and Livingston, on the Bay of Honduras, on the Caribbean Sea.

**People.**—About a third of the people are said to be of European descent, and the rest aborigines (Maya-Guaras) and negroes.

**Honduras.** The middle state of Central America, is bounded on the north and west by Yucatan; west and south by Guatemala; and east by the Bay of Honduras.

**Surface.**—Except for a narrow strip of swampland on the either side of the Bay of Amatique, the entire of elevated plains broken by broad and fertile plains and valleys, or a rise to mountain ridges that culminate in the Cordillera Occidental (10,120 feet). The Cordillera proper traverses the country irregularly in a northwest and southeast direction.

**Rivers and Climate.**—Honduras is watered by innumerable (small-navigable) streams; the Wanks or Tegucigalpa, the boundary with Nicaragua, has a length of 350 miles. Roatan and the other fertile bay islands, off the north coast, belong to Honduras. The climate is hot on the coast, but elsewhere fever prevails; but the highlands are cool, and fruit is not unknown. The flora and fauna are like those of Guatemala.

**Coast.**—The capital is Tegucigalpa. The ports are Amapala, on the Bay of Fonseca, Puerto Cortes or Puerto Cabello, Orma, and Truxillo.

**People.**—The whites are very few in number, the Indians (including Carib, negroes, and mixed race) including all but some 6,000 or 7,000 of the population.

**Nicaragua.** is the largest State of Central America, with a long seaboard on both the Atlantic and the Caribbean Sea, and having on the north and northeast the state of Honduras, and on the south Costa Rica.

**Surface.**—The state is traversed by the Cordillera of Central America, and the Pacific coast there is a remarkable depression extending for 300 miles and containing Lake Nicaragua and the smaller Lake Managua at no great elevation above the sea. Along the coast is a chain of volcanic cones, rising in some cases to 7,000 feet. From the Cordillera the surface slopes to the Caribbean coast (Mosquito territory), which is low and marshy.

**Rivers.**—Flowing eastward are the Coco or Wanks, the northern boundary; the San Juan, which drains Lake Nicaragua and separates Nicaragua from Costa Rica; the Bluefields and the Rio Grande. The low coast belt, called the Mosquito territory, is lined with salt lagoons.

**Climate.**—The climate is on the whole healthy, especially in the interior and mountainous parts.

**Vegetation.**—The forests include mahogany, rosewood, logwood, fustic, sandalwood, india-

rubber, medicinal plants, gums, and dyewoods. The rich soil of the western region yields maize (the staple food), coffee, cocoa, sugar, cotton, rice, tobacco, indigo, and a great variety of tropical fruits.

**People.**—Of the population of 600,000, one-third are Indians, and one-half mulattoes and negroes.

**Cities.**—The western districts contain the chief seats of population; there are the towns Managua, the capital; Leon, Granada, Chinandega, and Hivas.

**Navigation.**—The country is by far the most thickly populated of the Central American Republics, consists of a strip of territory stretching between Honduras and the Pacific. It is 140 miles in length by about 60 in average breadth.

**Surface.**—Except for a narrow seaboard of low alluvial plains, Honduras consists of a plateau, some 2,000 feet above the sea, furrowed by river valleys and broken by numerous volcanic cones, and bounded on the north by the Central American Cordillera. Of the volcanoes many are extinct; earthquakes are frequent.

**Rivers and Climate.**—The Lempa (140 miles) receives the surplus waters of the Laguna de Cuica, and the San Miguel drains the southern slopes of the Cordillera. The climate is equable, very healthy in the interior, and even along the coast less unwholesome than on the Atlantic seaboard of America, and the soil exceedingly fertile.

**Coast.**—The ports are Amatique, La Libertad, and San Salvador. The principal towns are San Juan de los Rios and San Miguel.

**People.**—The population consists mostly of (Asteo) Indians and white races, the latter numbering 20,000. The Indians almost all speak Spanish.

**Chili or Chile,** a country of South America, extends along the Pacific coast from latitude 33° degrees south nearly to Cape Horn, and including Chiloe and many other islands and part of Tierra del Fuego. It is bounded on the north by Peru (the river Sama being the boundary), on the northeast and east by Bolivia, and the Argentine Republic, from which it is separated by the chief range of the Cordilleras. Its length from north to south is about 2,400 miles; its breadth, on an average, 80 miles.

**Surface.**—The surface is greatly diversified, but rises in elevation as it recedes from the coast, and approaches the Andes, along the eastern and northern parts of the country, a series of low hills, or the Cordillera, runs. Some of the summits here rise to 20,000 feet or more, but the elevation decreases toward the south. Chiloe and numerous other islands rise from the coast in the south. Earthquakes are common.

In the Chilean Andes there are twenty volcanoes, at least three of which (Antuco, Villarica, and Osorno) are still active.

**Climate.**—The climate is remarkably salubrious. In the northern provinces it rarely rains—in some parts perhaps never; in the central parts rain is sufficiently abundant, while in the extreme south there is even an excess of moisture.

**Rivers.**—The rivers are numerous, but small, and have generally rapid currents; the principal are the Bio Bio, the Maipo, the Maule, Itata, and Chuapa (or Illapel).

**Cities.**—The chief are Santiago, the capital; Valparaiso, Talca, Concepcion, Iquique, and Chillan; the last four range from 50,000 to 60,000.

**People.**—The natives of Chili are a mixture of Spanish with the Araucanian Indians. In the upper classes the race has been kept pure. Spanish is the language of the South American country. The language spoken in Chili is Spanish, but with many local words of Indian origin.

**China, Manchuria,** and its dependencies of Mongolia, Tibet, and The Great Wall, the Chinese empire, embracing a vast territory in Eastern Asia only inferior in extent to the total dominions of Great Britain and Russia. The dependencies are not colonies but subject territories. The chief facts concerning the latter follow:

**Manchuria.** 362,510 square miles, population 10,000,000. It is the seat of the reigning dynasty, extends from the Gulf of Liaotung to the Helong, Kiang or Amur river. Its southern and central parts are fertile, with coal, gold and silver, and other metals are found in the north, and other Tungus still occupy the greater part of the country, but they are outnumbered by Chinese immigrants, who are gradually taking possession of all tracts fit for cultivation.

Three provinces: (a) Shangkai, in the south (54,780 square miles, population 5,000,000), capital Peking, 600,000; (b) Shantung, 60,000; (c) Port Arthur (now Japan); (d) Kirin, (103,000 square miles, population 2,000,000), capital 500,000. (e) Ching, 100,000 square miles, population 500,000 capital Tientsin, 600,000.

**Mongolia.** 1,100 square miles, population 1,800,000, mainly Buddhist Mongols, but also Calmucks and other Tatar tribes. It is a pastoral region, the chief of its wealth is its great herds of cattle, 70,000, sheep, 3,750, and horses, 10,000.

**Shankai.** 550,000 square miles, population 10,000,000. It is the seat of the Chinese empire, the basin of the Tarim, between the Tien Shan, or Celestial mountains, and the Kwen Lun (Chinese Turkestan), and extends to the Hsi to the north of the former. Most of the country is barren desert. Population much mixed, but the Turkish element and Mohandannum predominate. Capital, Urumchi, 25,000; Yarkand (4,000 feet above sea-level), 65,000; Kashgar, 50,000.

**Shen-Nor,** a pastoral highland region, named after the lake which occupies its center (10,400 feet), 274,000 square miles, population 150,000, Tangut Mongols.

**Tibet.** 477,320 square miles, population 1,500,000, the infertile tableland in the world, with mountains covered with eternal snow. The population is about 1,500,000, the chief of its wealth is its Upper Brahmaputra. The country is ruled by the Dalai Lama, an incarnation of Buddha, and the official capital is the Nanting (or Southern Capital), Lhasa (11,900 feet), 20,000, nearly one-half of its people are priests and monks.

**Surface.**—China proper may be described as sloping from the mountainous regions of Tibet toward the shores of the Pacific on the east and south. The most extensive mountain range is the Nanting (or Southern range), a far-extending spur of the Himalayas. Commencing in Yunnan, it bounds with a continuous barrier (penetrated by only a few difficult passes) Kwang, Kwangtung, and Fukien on the north, and, passing through Chekiang, reaches the sea at Ningpo. North of this long range, and west of the Nanting, the mountains of Northern Tibet, the country is mountainous, while to the east and from the great wall on the north, to the Poyang lake in the south, there is the Great Plain, comprising the greater part of the provinces of Shantung, Shantung, Honan, Anhui, and Kiangsu.

**Rivers.**—The rivers of China—called for the most part by the north, and *chiang* (kiang) in the south—include the Yellow River, and the Yangtze or Yangtze Kiang. They rise not far from each other among the mountains of Tibet. The Ho purues a tortuous course seaward through North China; the Kiang or Yangtze through central China. The terrible calamities caused by the inundation of the Hoang-Ho have procured for it the name of China's Sorrow. So recently as 1887 it burst its southern bank near Kwanghchau, and, having nearly thirty millions of people, and the destruction of millions of lives, into the populous province of Honan. The Ho is not much under the Chiang in length—somewhat over 3,000 miles.

The Great Canal, which goes farther east, water communication from Peking to Hang-chau in Chekiang, a distance of more than 600 miles. The lakes are many, but not so great as those of the north. **Animal Life.**—The animals are identical with or differ but little from those of Europe. In the south and southwest the tiger, the rhinoceros, and elephant are found; bears are common in many parts; other carnivores are the wild-cat, badger, lynx, marten, etc. Camels and elephants are used in a domestic state, but the chief domesticated animal is the horse. The horse is a poor creature. Among birds the most beautiful are the gold and silver pheasants. Fish swarm in all inland waters as well as on the coast, the natural supply being immensely increased by artificial means.

**Vegetable Life.**—As regards the flora of China, it is tropical in the south (coco and sago palms, banana, pandanus, etc.), subtropical in the north, and temperate in the north. A number of plants and trees identical with or closely akin to those of middle Europe. Flowering plants, shrubs, and trees are so

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exceedingly abundant, as to form a feature. The bamboo, from the immense number of uses to which it is put, is one of the most valuable trees. Oaks, the chestnut, hazel, pines, yew, walnut, etc., are among forest trees. Wax tree, camellia, tree tobacco, Azales are exceedingly numerous; other flowering plants are the camellia, rose, passion-flower, cactus, Lagerstroemia, etc. Fruits are abundant and varied.

**Climate.**—The greater part of China belongs to the temperate zone, but it has what is called an excessive climate. At Peking in summer the heat ranges from 90° to 100° in the shade, while in the winter so cold that the rivers are usually frozen from December to March. At Shanghai, the maximum temperature reaches 100°, and the minimum falls at least to 20° below freezing-point. In the south the climate is of a tropical character, the summer heat rising to 120°. Here the southwest and northeast monsoons blow with great regularity.

**Cities.**—The capital of China is Peking. Other chief towns are Sianquan; Singan; Canton; Hankau; Tientsin; Shanghai; Fuchau; Chungking; Suchau; Hangchow; Nanking; and Ningpo.

**Peoples.**—The Chinese people are the result of a fusion of various invading Mongolian tribes, from B. C. 3000 to 700 A. D., with the aborigines of various stocks; the Manchurian dynasty has ruled since 1644. Three types may still be recognized in China—a northern Manchu-Korean, a central and nearly pure Chinese, and a southern with Malayan and other admixtures.

**Colombia.**—A republic occupying the north-west corner of the South American continent, and till 1903, when Panama became independent, including also the Isthmus of Panama.

**Surface.**—The surface of the country is extremely varied, with lofty mountains in the west, and vast plains in the east scarcely above the level of the sea. From the central Cordillera descend the two principal rivers of Colombia, the Magdalena and its tributary the Cauca, which flow north into the Caribbean Sea, besides several affluents of the Amazon in the east, and the Pacific, which forces its way to the Pacific through a gorge between cliffs 10,000 to 12,000 feet high.

The eastern Cordillera, by far the largest, extends a great part of the way to the Andes, cool and healthy, and is the most thickly populated portion of the republic; on one of its plateaus, at an elevation of 8,094 feet, stands the capital, Bogotá. Eastward from this Cordillera stretch vast *llanos* or plains.

**Rivers.**—The chief rivers are the various tributaries of the Orinoco. Other rivers are the Sao Juan (navigable 150 miles), on the Pacific coast, and the Atrato and Zulia, flowing north.

**Climate.**—The climate is naturally as varied as the surface of the country, but over a great part of the republic is very hot. At Cartagena, on the Caribbean Sea, and on the Pacific coast, yellow fever is endemic at some places; while in the elevated country, as the plains of Bogotá, 8,000 feet above the sea, the climate is perfectly salubrious, and the temperature seems that of eternal spring.

**Vegetable and Animal Life.**—The flora is rich and luxuriant. A great part of the country is still covered with virgin forest, which yield excellent building-wood, Peruvian bark, caoutchouc, vanilla, etc.

The fauna includes the jaguar, puma, tapir, armadillo, sloth, various species of deer, and the gigantic condor.

**Cities.**—The chief towns are Bogotá, the capital, Medellín, Barranquilla, Cartagena, and Bucaramanga.

**People.**—The population is mainly descended from the numerous Indian tribes, partly Hispanized in language and habits. The chief aborigines of the country, the Chibcheas or Muzecas, inhabiting the plateau of Bogotá, were a comparatively civilized race at the discovery of the new world; the uncivilized Indians are now mostly confined to the eastern plains, the northern portion of Magdalena, and the districts of Darien and the Atrato. The pure whites form about a fifth of the

entire population, and the Indian half-breeds more than half; mulattoes and *zambos*, resulting respectively from the union of negroes with whites and Indians, exceed a sixth of the whole.

**Cuba.**—The most westerly and largest of the West Indian islands, since 1902 an independent republic, stretches in the form of a long narrow crescent, convex on the north side, at the entrance of the Gulf of Mexico, which it divides into two channels—the northwest, 124 miles wide, and the southwest, 98 miles at its narrowest part. Cuba is 759 miles long from north to west, with a breadth varying from 27 miles to 90 miles, and a coast-line of 1,976 miles.

**Rivers.**—The rivers, running north and south are navigable for only a few miles by small boats, but are very serviceable for irrigation.

**Climate and Vegetation.**—The climate, more temperate than in the other West Indian islands, is healthy in the elevated interior, but the coasts are the haunts of fever and ague. No month of the year is free from rain, the greatest rainfall being in May, June, and July. Earthquakes are frequent.

The soil is eminently fertile, a large part still covered with virgin forest, containing magnificent mahogany, cedar, etc.

**Cities.**—The chief commercial ports and harbors are, on the north, Havana (the capital), Cienfuegos, Sagua, and Matanzas; on the south, Santiago, Trinidad, Cienfuegos, and Guanatanamo.

**People.**—The population of Cuba may be classified into the following groups: white (58 per cent), black Cubans and colored Cubans (32 per cent), Spaniards and foreigners (9 per cent). The white Cubans are increasing at a rapid rate, whereas the blacks are barely holding their own. The former comprise the officials and the owners of the soil; the black and colored form the laboring classes; the Spaniards, the commercial class.

**Denmark.**—The smallest of the three Scandinavian kingdoms, consists of the peninsula of Jutland and a group of islands in the Baltic, and is bounded by the Skager-Rak, the Kattegat, the Sound, the Baltic, the Little Belt, and the North Sea.

**Surface.**—Except in Bornholm, the surface of Denmark is very similar in every part of the kingdom, and is uniformly low, its highest point, in the southeast, Jutland, being only 564 feet above sea-level. The coast is generally flat, skirted by sand-dunes and shallow lagoons, especially along the west side. Both the continental portion and the islands are penetrated deeply by numerous fiords, the largest being Limfjord, which intersects Jutland, and has insulated the northern extremity of the peninsula since 1825, when it broke through the narrow isthmus which had separated it from the North Sea.

**Rivers.**—Denmark has numerous streams but no large rivers; the principal is the Guden, which flows northeast through Jutland into the Kattegat. It is navigable for part of its course. Less important streams are the Holm, the Lønborg, and the Stor Åa. All the others are insignificant brooks and streamlets.

The lakes are very numerous but not large, none exceeding 8½ miles in length by about 1½ miles broad. There are numerous windings in the sea that penetrate far into the land. The largest of these, the Limfjord in Jutland, entering from the Kattegat by a narrow channel, winds its way through to the North Sea, where it meets the open sea, and really an island. In this fiord, which widens out greatly in the interior and gives off various minor fiords, there are one large and various small islands.

**Climate.**—The climate is milder, and the air more humid than in the more southern but continental Germany; it is not unhealthy, except in the low-lying islands, such as Læsø, where the effects of the sudden heat of the summer occasions fevers.

**Vegetation.**—The center and west of Jutland is nearly bare of wood, but in the other parts of the peninsula the forests, especially of oak, cover about 215,000 acres, and in the islands over 291,000 acres.

**Cities.**—Copenhagen is the capital; other chief

towns are Odense, Aarhus, Aalborg, Randers and Horsens.

**People.**—The population of Denmark is composed almost exclusively of Danes, with a few thousand Swedes and Germans. The Danes have regular features, fair or brownish hair, and blue eyes. They still maintain their reputation for seafaring skill and hospitable customs.

**Dominican Republic.**—for Santo (commonly San) Domingo, a state formed of the eastern portion of Hayti.

**Surface and Vegetation.**—The country is mountainous, being traversed longitudinally by northern, central, and southern ranges, terminating in headlands on either coast; but between these ranges are wide and fertile plains. The highest peak is Loma Tina.

The mountains are clothed with forests of pine and oak, and the island is rich in mahogany, satinwood, rosewood, and other valuable timbers. Cotton, rice, maize, cocoa, ginger, arrowroot, yams, tobacco, and numerous fruits are indigenous.

**Climate.**—The climate is hot and moist in the lowlands, the temperature at Port au Prince ranging from 67° to 104° F.; the mean range in the highlands is from 60° to 70° F. Earthquakes are frequent, and occasional hurricanes visit the island.

**People.**—The population is mainly of mixed race descended from the original Spanish inhabitants and the aborigines. Spanish is the prevailing language.

**Ecuador.** a republic of South America, so named from its position on the equator, is bounded on the west by the Pacific Ocean, and is inserted like a wedge between Colombia and Peru. But its only certain limits are those defined by the ocean, where it has a seaboard of some 400 miles; most of the frontier east of the Andes has never been determined.

**Surface.**—Ecuador consists of three divisions—the lowlands west of the Andes, the mountainous plateau of the interior, and the elevated forest country to the east. Besides the main range of the Andes, forming the backbone of the country, there is an outer range, with peaks rising to 15,000 feet; from the cordillera proper numerous long spurs, attaining a height of 14,000 feet, are thrown out toward the east, between which rise great affluents of the Amazon, while the coast range presents only short and very precipitous spurs.

The principal mountains of Ecuador either are or have been volcanoes. Tunguragua (16,690 feet) broke out in 1887; Pichincha is by no means extinct; Cotacachi and Sangai (17,465) are constantly active.

**Rivers.**—Of the coast streams the principal are the Guayasquil river, and the Rio Esmeraldas; east of the Andes the chief rivers are the Napo and its affluents, flowing into the Marañon.

**Animal Life.**—The country is comparatively poor in mammals, although various kinds of deer as well as tapirs and peccaries are found in the forests. Parrots and humming birds are also numerous, but perhaps the most remarkable of the birds of Ecuador is the condor, which dwells on the slopes of the Andes. Reptiles, including serpents, are numerous.

**Vegetation and Climate.**—The forests yield cinchona bark, caoutchouc, sassaaparilla, vegetable ivory, etc. The climate on the plains, both in the east and the west, is moist, hot, and unhealthy. In the higher regions the climate is rugged, cold, and dry, except the elevated valleys, as that of Quito, enjoy a delightful climate.

**Cities.**—The principal cities are Quito (the capital), Guayaquil (the chief port), Cuenca, Esmeraldas, Latacunga, and Ambato.

**People.**—Of the present population, the aboriginal red race form more than half; the rest are negroes, mulattoes, mestizos (a degenerate breed of mixed negro and Indian blood), and Spanish creoles or whites. The latter are the chief possessors of the land, but are deficient in energy.

**France.** a maritime country in the west of Europe, forming one of its most extensive, most populous, and most influential states. It is bounded on the north by the Straits of Dover

and the English channel; west by the Atlantic (Bay of Biscay); south by Spain and the Mediterranean Sea; east and northeast by Italy, Switzerland, Germany, and Belgium. Its greatest length from north to south is 600 miles, and its greatest breadth 547 miles.

**Divisions.**—France, formerly divided into some provinces (Normandy, Brittany, Champagne, Burgundy, Auvergne, Languedoc, Provence, etc.—see the separate articles), was at the revolution redistributed into departments named generally after the rivers. These departments cover an area of 1,600 and 2,600 square miles in area, are, including Corsica and the territory of Belfort, thirty-seven in number.

**Possessions.**—The possessions of France outside Europe, both colonies and protectorates, cover an aggregate of 4,072,076 square miles, and have a population of more than 61,000,000 inhabitants. Of these, Algeria is rapidly becoming a part of France proper, and is considered as such for nearly all administrative purposes. The large territory of the Tunis has since 1881 been under French protection. By a treaty signed in 1893 Madagascar was placed under the protection of France, which also now holds a large area in West Africa, in Guinea, the Ivory coast, and on the Gaboon and Congo. In Asia, Tonkin was placed under French protection, and portions of Siam acquired in 1893. The details of the French colonies and protectorates are given in the subjoined table:

	Area square miles	Pop.
In Asia—		
French India.....	190	273,000
Cochin-China.....	22,000	2,900,000
Tonkin and Laos.....	144,400	7,641,900
Annam.....	52,100	6,124,000
Cambodia.....	37,400	1,500,000
In Africa—		
Algeria.....	184,474	4,736,300
Tunis.....	1,000,000	2,000,000
Western Sahara.....	1,544,000	2,550,000
Senegal.....	80,000	1,800,000
Sierra Leone and Niger.....	210,000	3,000,000
French Guinea.....	95,000	2,300,000
Ivory Coast.....	116,000	2,000,000
Guiney.....	60,000	1,000,000
Senegal.....	1,160,000	10,000,000
Roman Coast.....	45,000	200,000
Madagascar.....	173,200	900,000
Comoro Isles.....	620	47,000
Mayotte.....	140	17,000
Madagascar.....	227,000	2,700,000
In America—		
Guiana.....	30,500	32,910
Guadeloupe, etc.....	688	182,110
Martinique.....	380	203,780
St. Pierre and Miquelon.....	92	6,250
In Oceania—		
New Caledonia, etc.....	7,650	51,410
Establishments, Oceania.....	1,520	29,000
Total.....	4,072,076	61,139,340

**Surface.**—The territory of France proper embodies highlands in the south and southwest; in the south it comprises the northern slopes of the Pyrenees, and toward the southeast frontier part of the Alps. The remainder of the territory is nearly equally divided between extensive lowlands in the northwest and a great plateau which covers the southeastern half, but is separated from the Alps by the broad and deep valley of the Lower Rhone.

**Mountains.**—The interior is traversed from southwest to northeast by successive chains of mountains, commencing with the Pyrenees and including the Cevennes, the Côte d'Or, the Vosges, and others, forming the watershed, on one side of which the rivers flow west and north into the Atlantic and the English channel, on the other side east and south into the Mediterranean. At its northeastern extremity this system is met by the Alps and the Jura. A considerable portion of the western Alps belongs to southeastern France. Mt. Blanc itself (15,781 feet) is mostly within the French boundary-line. Some lofty Pyrenean peaks are also within French territory, on the highest being Vignemale (10,792 feet). Near the center of France, and separate from the great watershed of the country, are several groups of volcanic mountains known by the general name of the mountains of Auvergne, the chief peaks of which are the Plomb du Cantal (5,983 feet), the Puy de Sancy (6,100 feet), and the Puy de Dôme.

**Rivers.**—The square thrown off by the great watershed divide France into seven principal river basins, six of which are on the north-western slope and one on the southeastern. These are:

1. The basin of the Garonne and its affluents (the Arège, Tarn, Lot, and Dordogne on the right, and the Gers on the left); with the two secondary basins of the Charente on the north, and the Adour on the south.

2. The basin of the Loire and its tributaries (Nièvre and Maine on the right, the Allier, Indre, Cher, Indre, Vienne, and Sèvre Nantaise on the left).

3. The basin of the Seine and its tributaries (the Aude, Marne, and Oise on the right, the Yonne and Eure on the left). To the north is the English Channel, and to the south the Atlantic.

4. The basin of the Meuse, with its affluent the Sambre.

5. The basin of the Escaut or Scheldt, with its affluent the Rhine. Only a comparatively small portion of these two basins is included within the political boundaries of France.

6. The basin which pours a number of tributaries, the principal of which is the Moselle, into the Rhine. Only a comparatively small portion of this basin also is included within the political boundaries of France.

7. The basin of the Rhone, occupying the whole of the territory which lies to the southeast of the great watershed, the tributaries being the Ain, the Saône, Ardèche, and Gard on the right, and the Isère, Drôme, and Durance on the left. The secondary basins are those of the Var and the Aude. The four great rivers of France are the Loire, Seine, Rhone, and Garonne. France has in all more than 200 navigable streams, with a total navigation of about 6,000 miles. Lakes are few, and individually very limited in extent.

**Climate.**—France enjoys on the whole a very fine climate; not so continental as that of central Europe, nor so maritime as that of England. If we omit the highilly tracts of the Alps and the Pyrenees, the coldest region of France is evidently that of the high plateau of its cold winters, though it has hot summer days. The climate of Brittany is very much like that of the southwest of England; while that of the plains on the Bay of Biscay is warm and dry, and the slopes of the Pyrenees, has the deserved reputation of a sanitary station. The climate of Languedoc and Provence assumes a tropical character, and Africa, and the temperate winter is succeeded by a burning hot summer, moderated from time to time by the mistral.

**Cities.**—More than 8,000,000 people live in the twenty-seven chief cities having each more than 30,000 inhabitants. Fifteen cities have populations of more than 100,000: Paris, Marseilles, Lyons, Bordeaux, Lille, Toulouse, St. Etienne, Roubaix, Nantes, Le Havre, Rouen, Rheims, Nice, Nancy and Toulon. There are 182 cities of two others of over 50,000 inhabitants.

**People.**—The character of the French people combines the impressibility, the vivacity, the rapidity of conception, and the artistic

feeling of the men of the south with the persistence, laboriousness, and rationalism of the men of the north. Their language was developed out of the *lingua Romanorum* of the Roman conquerors, which displaced the native Celtic tongues, and was afterward modified in vocabulary and phonetics (but not in structure) by the invading Teutonic Franks, who gave their own names both to the language and to the country. In the south the Provençal, another Romance type, is still the popular dialect. In the northwest the ancient Celtic Breton tongue survives and in the southwest the distinct and peculiar Basque language is spoken in the department of Basse-Pyrénées. Finnish is spoken in French Finland, the Walloons speak their own Romance dialect in the northeast of France; and German is still spoken in some districts of those parts of Alsace and Lorraine still left to France.

**Germany** (or the German empire) lies between the Baltic Sea, Denmark, and the North Sea on the north, and Switzerland and Austria-Hungary on the south. The greatest length measured from near Memel in the northeast to beyond Mülhausen in the southwest, is 330 miles, and the shortest, from Swinemünde at the mouth of the Oder to beyond Rastatt in the (Saxon) Lusatia, 196 miles. The states of the empire, together with their areas, and their populations in 1905, are shown in the following table:

STATES	AREA SQ. MILES	POPULATION
KINGDOMS		
1. Prussia.....	134,616	37,293,324
2. Bavaria.....	39,292	6,624,372
3. Saxony.....	5,769	4,508,601
4. Württemberg.....	7,534	2,302,179
Grand Duchies		
5. Baden.....	5,823	2,010,728
6. Hesse.....	2,966	1,209,175
7. Mecklenburg-Schwerin.....	1,628	625,045
8. Saxe-Weimar.....	1,397	388,095
9. Mecklenburg-Strelitz.....	1,131	103,451
10. Oldenburg.....	2,225	108,836
Duchies		
11. Brunswick.....	1,418	455,465
12. Saxe-Meiningen.....	935	298,910
13. Saxe-Altenburg.....	511	206,508
14. Saxe-Coburg-Gotha.....	764	242,432
15. Anhalt.....	888	358,029
PRINCIPALITIES		
16. Schwarzburg-Sonderhausen.....	333	85,152
17. Schwarzburg-Rudolstadt.....	363	96,833
18. Waldeck.....	433	99,127
19. Reuss-Greiz.....	319	144,584
20. Reuss-Schleiz.....	122	70,603
21. Schaumburg-Lippe.....	131	44,922
22. Lippe-Deimold.....	460	145,577
FREE TOWNS		
23. Lübeck.....	115	105,857
24. Bremen.....	99	263,440
25. Hamburg.....	160	874,878
REPUBLICS		
26. Alsace-Lorraine.....	5,604	1,814,664
Total.....	208,700	60,641,278

The following is a list of the various colonies and regions under the protection of influence of Germany, the estimates being necessarily vague:

COLONIES AND DEPENDENCIES	DATE OF ACQUISITION	METHOD OF GOVERNMENT	ESTIMATED AREA SQ. MILES	ESTIMATED POPULATION
In Africa				
Togo-Land.....	1884	Imperial Governor	33,700	1,000,000
Kamerun.....	1884	Imperial Governor	191,130	3,000,000
German Southwest Africa.....	1884-90	Imperial Governor	322,435	1,200,000
German East Africa.....	1885-90	Imperial Governor	384,150	10,000,000
Total African Possessions.....	1884-90		931,460	14,120,000
In Asia				
Kiao-chow Bay.....	1897	Imperial Governor	200*	*33,000
In the Pacific				
German New Guinea.....	1885-86		70,000	200,000
Bismarck Archipelago.....	1885		20,000	30,000
Caroline Islands.....	1899	Imperial Governor	550	56,000
Marshall Islands.....	1899		250	
Micronesia Islands.....	1899		4,200	
Samoa Islands.....	1886		150	
Swain's Island.....	1899	Imperial Governor	640	37,000
Upolu.....	1899		210	
Total Pacific Possessions.....	1884-90		96,160	393,000
Total Foreign Dependencies.....	1884-90		1,027,820	14,546,000

\*Exclusive of the bay with an area of about 200 square miles, and the neutral zone with an area of about 2,500 square miles, and population of 1,200,000.

**Surface.**—Germany proper presents two very distinct physical formations:

1. A range of high table-land, occupying the center and southern part of the country, interspersed with numerous ranges and groups of mountains, the most important of which are the Harz and Teutoburgwald, in the north; the Taunus, Thuringerwald, Erzgebirge, and Riesengebirge, in the middle; and the Black forest (Schwarzwald), Raube Alb, and Bavarian Alps in the south (with the Zugspitze, the highest point in Germany, 9,665 feet high); and containing an area of 110,000 square miles.

2. A vast sandy plain, which extends from the center of the empire north to the German Ocean, and from the Netherlands into Russia, contains an area of about 98,000 square miles, and is varied by slight terrace-like elevations marked by summits of 600 to 800 feet high. A large portion of the plain is occupied by sandy *travertis* interpermed with deposits of peat; but other parts are moderately fertile, and admit of successful cultivation.

**Rivers.**—The surface of Germany may be regarded as belonging to three drainage basins. The Danube from its source in the Black forest to the borders of Austria belongs to Germany; and through its channel the waters of the greater part of Bavaria are poured into the Black Sea. By far the greater part of the surface has a northern slope, and belongs partly to the basin of the North Sea, partly to that of the Baltic. The chief German streams flowing into the North Sea are the Rhine, with its tributaries the Neckar, Main, Lahn, Sieg, Wupper, Ruhr, and Lippe on

the right, and the Ill and Moselle on the left; the Weser and the Elbe. Into the Baltic flow the Oder, Vistula, Memel, and Pregel. The natural and artificial waterways of Germany are extensive, especially in the northern plain, and connect the rivers flowing into the Baltic and the North Sea with those flowing into the English channel and the Black Sea. The North Sea and Baltic ship canal, from Brunsbüttel at the mouth of the Elbe to Kiel (1887-95), is intended chiefly for warships.

Numerous lakes occur, but few of them are of any great size. The so-called "haffs" of the north coasts are landlocked salt-water lagoons or coast lakes. Mineral springs occur principally in Nassau, Württemberg, Baden, Bavaria, and Rhenish Prussia.

**Climate.**—The climate of Germany presents less diversity than a first glance at the map might lead one to infer. Though the country extends over 8½° of latitude, its mean annual temperature is remarkably uniform. This is owing mainly to the different elevations of the surface, the low plains of the north having a higher, while the hills and plateaus of the south have a lower temperature than their latitudes might seem to indicate. The mildest climate is enjoyed by the valleys of the Rhine and the Moselle.

**Cities.**—German towns are officially distinguished as large towns (with 100,000 inhabitants and upward); medium towns (20,000 to 100,000 inhabitants); small towns (5,000 to 20,000 inhabitants); and country towns (2,000 to 5,000 inhabitants). In 1905 only 1 town had over 1,000,000 inhabitants; 10 others over 250,000; 30 others over 100,000;

43 between 50,000 and 100,000; and 137 between 20,000 and 50,000. Of these the chief are Berlin (the capital of the empire), Hamburg, Munich, Dresden, Leipzig, Breslau and Cologne.

**People.**—Of the German-speaking inhabitants of the empire, a considerable proportion are not of German stock. Among the peoples retaining their own language are Poles (exclusively in eastern and northeastern Prussia); Wends (in Silesia, Brandenburg, and Saxony); Czechs (in Silesia); Lithuanians (in eastern Prussia); Danes (in Schleswig); French (in Rhenish Prussia, Alsace, and Lorraine); and Walloons (about Aix-la-Chapelle in Rhenish Prussia).

The Germans are divided into High and Low Germans; the language of the former is the cultivated language of all the German states; that of the latter, known as *Platt deutsch*, is spoken in the north and north-west.

**Great Britain** is so distinguished from Britannia Minor, or Brittany, in France, and was not officially so called till in 1064 James I. styled himself "King of Great Britain."

Great Britain is the largest island of Europe and is bounded by the Atlantic, the North Sea, the English channel, the Irish Sea, and St. George's channel. The most northerly point is the *Scilly* head, in Caithness; the most southerly, Lizard point, in Cornwall; and the most easterly, Lowestoft Ness, in Suffolk; and the most westerly, Ardnamurchin point, in Argyllshire. Its greatest length is about 608 miles, and its greatest breadth (from Land's End to the east coast of Kent) about 325 miles.

### THE BRITISH EMPIRE THE UNITED KINGDOM

COUNTRY	CHARACTER OF POSSESSION	FORM OF GOVERNMENT	EXECUTIVE	AREA IN SQUARE MILES	HOW ACQUIRED BY ENGLAND	DATE	POPULATION
ENGLAND.....	Constitute the United Kingdom of Great Britain and Ireland	Constitutional monarchy	The King through the ministry.	56,439	Conquest.....	1282	32,527,843
SCOTLAND.....				29,785	Union.....	1603	4,472,108
IRELAND.....				32,583	Conquest.....	1172	4,488,778
ISLANDS.....				302			150,898

### COLONIES AND DEPENDENCIES

COUNTRY	CHARACTER OF POSSESSION	FORM OF GOVERNMENT	EXECUTIVE	AREA IN SQUARE MILES	HOW ACQUIRED BY ENGLAND	DATE	POPULATION
<b>EUROPE—</b>							
Gibraltar.....	Colony.....	Representative.	Governor.....	2	Conquest.....	1704	27,460
Malta, etc.....	Colony.....	Representative.	Governor.....	122	Treaty cession.....	1814	188,141
<b>ASIA—</b>							
India (including Burma).....	Viceroyalty.....	Governor-General.....	Governor-General.....	1,800,258	Conquest.....	Began 1757	294,360,334
Ceylon.....	Colony.....	Governor.....	Governor.....	25,365	Transfer to E. India Co.	1858	3,878,733
Cyprus.....	Protectorate.....	High Commissioner.....	High Commissioner.....	3,584	Treaty cession.....	1801	237,022
Aden and Socotra.....	Protectorate.....	Political Resident.....	Political Resident.....	3,070	Convention with Turkey (Aden) Conquest.....	1839	44,000
Straits Settlements.....	Colony.....	Governor.....	Governor.....	1,500	Treaty cession.....	1785-1824	272,249
Hongkong.....	Colony.....	Governor.....	Governor.....	30½	Treaty cession.....	1841	380,159
Labuan.....	Colony.....	Governor.....	Governor.....	81	Treaty cession.....	1846	8,411
British North Borneo.....	Colony.....	Responsible.	Governor.....	31,000	Cession to company.....	1877	173,000
<b>AFRICA—</b>							
Cape Colony.....	Colony.....	Responsible.	Governor.....	276,800	Treaty cession.....	1858-1894	2,433,000
Natal and Zululand.....	Colony.....	Responsible.	Governor.....	29,200	Annexation.....	1843	925,118
Nt. Bekeba.....	Colony.....	Responsible.	Governor.....	47	Conquest.....	1873	5,200
Seychelles.....	Naval Station.....	British Admiralty.....	British Admiralty.....	38	Annexation.....	1815	237,430
Sierra Leone.....	Colony.....	Representative.	Governor.....	4,000	Settlement.....	1787	76,655
British Guinea, Gold Coast, etc.....	Colony.....	Representative.	Governor.....	339,900	Treaty cession.....	1872	23,455,000
Mauritius, etc.....	Colony.....	Representative.	Governor.....	1,063	Conquest and cession.....	1810, 1814	392,500
British South and East Africa.....	Colony.....	Responsible.	Governor.....	1,989,247	Conquest and cession.....	1870-1890	14,911,000
Transvaal.....	Colony.....	Responsible.	Governor.....	119,139	Conquest.....	1900	1,091,156
Orange River Colony.....	Colony.....	Responsible.	Governor.....	46,326	Conquest.....	1900	207,503
<b>AMERICA—</b>							
Dominion of Canada.....	Dependency.....	Commonwealth.	Governor-General.....	3,745,574	Conquest and settlement.....	1670-1858	1,000,000
Ontario.....	Province.....	Representative.	Lieutenant-Governor.....	260,562	Conquest.....	1759-1760	2,182,947
Quebec.....	Province.....	Representative.	Lieutenant-Governor.....	241,650	Conquest.....	1759-1760	54,898
New Brunswick.....	Province.....	Representative.	Lieutenant-Governor.....	27,985	Treaty cession.....	1763	331,120
Nova Scotia.....	Province.....	Representative.	Lieutenant-Governor.....	21,428	Conquest.....	1627	459,074
Manitoba.....	Province.....	Representative.	Lieutenant-Governor.....	78,219	Settlement.....	1870	265,082
British Columbia.....	Province.....	Representative.	Lieutenant-Governor.....	312,363	Transfer to crown.....	1858	178,057
Alberta.....	Province.....	Representative.	Lieutenant-Governor.....	255,540	Settlement.....	1870	185,412
Saskatchewan.....	Province.....	Representative.	Lieutenant-Governor.....	250,550	Settlement.....	1870	185,412
Territories.....	Province.....	Representative.	Lieutenant-Governor.....	1,922,735	Settlement.....	1870	158,940
Prince Edward Island.....	Province.....	Representative.	Lieutenant-Governor.....	2,184	Conquest.....	1743	103,259
Newfoundland.....	Province.....	Responsible.	Governor.....	42,200	Treaty cession.....	1713	121,037
British Guiana.....	Colony.....	Responsible.	Lieutenant-Governor.....	104,000	Conquest and cession.....	1803-1814	294,000
British Honduras.....	Colony.....	Responsible.	Lieutenant-Governor.....	7,662	Conquest.....	1798	37,479
Jamaica.....	Colony.....	Responsible.	Governor.....	10,990	Conquest.....	1655	775,000
Trinidad and Tobago.....	Colony.....	Responsible.	Governor.....	1,066	Settlement.....	1662	105,000
Barbados.....	Colony.....	Responsible.	Governor.....	166	Settlement.....	1625	84,200
Bahamas.....	Colony.....	Responsible.	Governor.....	10	Settlement.....	1612	21,258
Bermuda.....	Colony.....	Responsible.	Governor.....	19	Settlement.....	1609	258,000
Other Islands.....	Colony.....	Responsible.	Governor.....	8,742	Settlement.....	1609	258,000
<b>AFRICA AND AMERICA—</b>							
Commonwealth of Australia.....	Dependency.....	Commonwealth.	Governor-General.....	2,072,573	Settlement.....	1803	3,774,288
Tasmania.....	Dependency.....	Responsible.	Governor.....	29,115	Purchase.....	1803	174,280
Dominion of New Zealand.....	Dependency.....	Responsible.	Governor.....	104,032	Purchase.....	1840	772,660
Fiji.....	Colony.....	Responsible.	Governor.....	7,423	Cession from the natives.....	1874	120,050
New Guinea (British).....	Colony.....	Responsible.	Administrator.....	84,000	Annexation.....	1884	550,000

**Surface.**—The northern part of Britain is, for the most part, rugged, mountainous, and barren, this being the character of much of Scotland. To the north of a line drawn from the Firth of Clyde on the west to Stonehaven on the eastern coast is the region generally known as the highlands. To the north and northern and a southern portion by the great hollow of Glenmore through, which runs the Caledonian canal.

The chief feature of the southern portion is the mountain mass of the Grampians, the culminating points of which, Ben Nevis and Ben Macdui, are the highest British summits. South of the highlands lie the plains, into the Firth and Clyde a region of coal and iron, in which the chief manufacturing industries of Scotland are carried on. South of this again is the elevated region of the southern highlands or southern uplands, less rugged and more pastoral than the highlands proper.

Toward the southeast are the Cheviot hills, on the borders of England and Scotland. Here commences the long Fennine chain running south into England, branching off into the mountains of Cumberland and the lake district (Cumbrian mountains), and terminating beyond the Peak of Derby, in the heart of England. The highest summit of the English mountains is in the northwest (lake district), namely, Scafell, 3,210 feet. Farther south and west is the Cambrian range, spread over the green of Wales, and containing, among the highest, the highest mountain of South Britain—Snowdon, 3,571 feet.

Over great parts of England the elevations are mostly insignificant, and the general character of the country is that of undulating plains.

**Rivers.**—The chief rivers entering the sea on the east coast, proceeding from north to south, are the Spey, Don, Dee, Tay, Forth, Tweed, Tyne, Uss, Trent, and Thames, the last named in navigable importance the greatest river of England. The rivers of importance empty either on the north or south coast. From the western coast, the rivers which descend in that direction have generally a short course, and are comparatively unimportant. From the eastern coast, to this rule are the Clyde and the Severn.

Owing to the great central flat of Ireland its rivers usually flow on in a gently winding course in different directions from the coast. Those of importance are not very numerous; but one of them, the Shannon, is the longest river of the British isles, its length being about 225 miles; while the Thames is 215. The Tay (length 130 miles) is said to have the largest volume of water.

The lakes of the British isles are distinguished for beauty rather than size; the largest, but among the least important, is Lough Neagh, in the north of Ireland.

**Climate.**—Their maritime situation has a favorable effect on the climate of the British isles, making it milder and more equable than that of continental countries in the same latitude. The temperature of the Atlantic, raised by the influx of the gulf stream, is communicated to the winds and vapors which are wafted along its surface, and the prevailing westerly breeze being from the southwest, the country is kept constantly at a relatively high temperature. The southwest winds, too, are charged with vapor, and often bring rain, thus supplying the country with abundant moisture. Ireland, from its more westerly position, has these characteristics in the most marked degree, the warmth and moisture of the west winds striking it markedly "a green island." For the same reason the western shores of the islands have a milder and more equable temperature than the eastern shores, the former being on an average one or two degrees cooler in summer and several degrees warmer in winter.

**Cities.**—The three largest cities in Wales are Cardiff, Rhonda, and Merthyr Tydfil. The capital of England and of the British empire is London. The cities next in size (in order of population) are Liverpool, Manchester and Salford, Birmingham, Leeds, Sheffield, Bristol, Bradford, Nottingham, and Hull.

The capital of Scotland is Edinburgh. Glasgow, Dundee, and Aberdeen each con-

tain upward of 150,000 inhabitants. After these come, in order of population, Perth, Leith, Greenock, Coatbridge, Kilmarnock, Kirkcaldy, Perth, Hamilton, Motherwell, and Falkirk.

The capital of Ireland is Dublin; the other chief towns are Belfast, Cork, Limerick, and Londonderry.

**People.**—The earliest inhabitants of the United Kingdom known to history were Celts, who came from Great Britain and Ireland at the time of the Roman occupation. In the fifth and sixth centuries, however, the Celts were displaced through the greater part of South Britain and in the eastern lowlands of North Britain by the Anglo-Saxons, a Teutonic race from which the modern English and lowland Scotch are mainly descended. The Celts as a distinct people were gradually confined to the mountainous districts of Wales and Cornwall and the highlands of Scotland, and only in Wales and Scotland has the Celtic language survived in Great Britain, being still also spoken by many in the west of Ireland. There is a considerable Celtic element, however, among the population everywhere.

**Greece** is a maritime kingdom in the southeast of Europe. The country is composed of a large central part, almost separated into two parts by the gulfs of Patras and Lepanto on the west, and the gulf of Argina on the east, the archipelago of the *Agæan* Sea, and the Ionian islands, and is divided into twenty-six provinces, called nomarchies.

**Surface.**—The mountain range which cuts off the peninsula from the continent of Europe is an extension of the Balkans. From it run chains from north-northwest to south-southeast, which form the skeleton of Greece. The western boundary of Thessaly is formed by Pindus, the main offshoot of the Balkans. The eastern boundary is also marked not only by the sea but by important mountains derived from the Balkan system. These are Olympus, Ossa, Mavroviti, and Pelion. The southern branch of Pindus, forming the southern boundary of Thessaly. This branch is continued in the celebrated mountains Parnassus and Helicon, forms the land of Attica, and reappears as the islands of Cos, Cythnos, and Siphnos. The Peloponnesus, "the island of Pelops," or by its modern name the Morea, is connected with northern Greece merely by the narrow isthmus of Corinth, now crossed by a canal; its highest point is Taygetus.

**Rivers.**—The rivers of Greece are unimportant. The chief in the Peloponnesus are the Eurotas (Basilopotamo), the Alpheus (Ruphis), draining Arcadia and Elis; and the Peneus, draining Elis.

**Climate.**—The climate is generally mild, in the parts exposed to the sea equable and genial, but in the mountainous regions of the interior sometimes very cold. None of the mountains attains the limit of perpetual snow; but several retain it far into the summer. During summer, rain rarely ever falls, and the channels of the minor streams become dry. Toward the end of harvest rain becomes frequent and copious; and intermittent fogs become common.

**Cities.**—Athens is the capital. The next in size are Patras, Piræus, and Trikala, all above 20,000; and there are eight others between 20,000 and 10,000.

**People.**—The Greeks called themselves *Hellenes*, and the inhabitants of Italy called them *Græci*. The modern Greeks are by no means pure-bred descendants of the ancient Greeks. Indeed, it has been maintained that from the seventh century A. D. there have been no pure Greeks in the country, but only Slavs. It is, however, pretty certain that the 244 million of modern inhabitants are descendants of three races that conquered the soil at the time of the Roman conquest.

**Hayti, or Haiti**, is, after Cuba, the largest of the West Indian islands, now divided into the independent states of Hayti and the Dominican Republic. It is nearly equidistant from Porto Rico, Cuba, and St. As in the rest of the Greater Antilles, its greatest length (about 400 miles) is in the direction—from west to east—of the chain of which it forms a part; its greatest breadth

is 160 miles. Area, including the islands of Young, Gonave, nearly that of Scotland. **Surface and Rivers.**—It is intersected west to east by three chains of mountains, connected by offsets, with extensive plains and savannas between. The central chain contains the highest peaks. The lowest and most fertile plain is the fertile Vega Real, between the northern and central ranges.

The rivers are numerous, but of small size. Climate is tropical. The whole is one of the healthiest of the West Indian islands. The seasons are a wet, during which heavy rains are most frequent in May and June; and a dry, during which little or no rain falls.

**Animals and Vegetables.**—Like the fauna, it includes the agouti, European cattle and pigs run wild, snakes, caymans, turtles, etc. The flora includes pine, mahogany trees, fustic, satinwood, lignum vitae, and other cabinet and dye woods, plantains, bananas, yams, batatas, oranges, pineapples, etc.

**Cities.**—Among the principal towns in Hayti are Port au Prince, San Domingo, Jacmel, and Cap-Haïtien.

**People.**—The population, consists of negroes and mulattoes, with a considerable admixture of whites. The dialect is a debased French.

**Italy** is a kingdom occupying the central of the three great peninsulas of southern Europe, together with Sicily, Sardinia, and some smaller islands. The peninsula, which at the Strait of Otranto approaches within less than 50 miles of Albania, is bounded west and south by that portion of the Mediterranean known as the Tyrrhenian Sea, east by the Adriatic, and north by the Alps, separating it from France, Switzerland, and Austria-Hungary. Its greatest length is 710 miles; the breadth ranges from 351 miles in the north to about 20 between the Gulfs of Sts. Eufemia and Squillace, but in most places is about 90 or 100 miles.

**Surface.**—Among the principal physical features of Italy are the Alps on its northern frontiers, and the chain of the Apennines, which run down the middle of the peninsula through the center of the Strait of Messina, while numerous branches branch off laterally, and form an endless succession of wooded hills, olive-clad slopes, and fertile valleys.

The Po, in the north, enclosed between the ranges of the Alps and Apennines, is a vast and fertile plain, intersected by the Po and its tributaries. Two active volcanoes belong to the kingdom, Vesuvius in Southern Italy and Etna in Sicily. The eastern shore of Italy is generally flat and uninteresting, presenting particularly along its northern part a series of sandy islands and lagoons, which dam up the mouths of the rivers, and occasion the formation of pestilential marshes.

On the west coast the same thing is occasionally seen, as in the case of the Pontine marshes and the Tuscan Maremma; but as a rule the west coast is more elevated, and often presents delightful scenery, as around the Gulf of Genoa and the Bay of Naples.

**Rivers.**—The whole of northern Italy belongs to the basin of the Po. The Adige and Brenta are other streams. Many of the Po's tributaries spread out at the foot of the Alps into considerable bodies of water, among which are the Lago di Garda, Lago Maggiore, and Como. From Rimini to the Gulf of Trieste the Adriatic coast is flat and marshy, and fringed by lagoons.

**Climate.**—The climate of Italy is the climate resembles that of Africa, being dry and burning and subject to the sirocco. In the northern regions, the neighborhood of the Alps, and the abundance of water courses, serve to maintain a pleasant temperature. Yet this region is at times extremely cold, especially in the interior of the great plains. In general the climate of Italy is healthy, except in the marshy districts, such as the rice plantations of Lombardy, the Tuscan Maremma, the Campagna of Rome, and the Pontine marshes, which give rise to exhalations ungenial to the human system. The coast of the Gulf of Genoa, is a favorite winter resort from more northern regions.

**Vegetable Life.**—The natural productions of the soil of Italy are as various as its climate. In the Alpine regions all plants belonging

to temperate climates flourish, while the southern regions possess almost a tropical flora. Its wines are numerous and celebrated, and olives and olive-oil are furnished by Tuscany, Liguria, and the province of Bari; while fruit abounds and is largely exported. The cultivation of silk forms an important agricultural industry.

**Cities.**—The largest city is Naples. Rome is the capital. Milan, Turin, Palermo, Genoa, Florence, rank next. There are four others about 150,000; and 23 towns over 50,000.

**People.**—The population of Italy is in general homogeneous. There are, however, varying numbers of French, Teutonic, Albanian, Greek, and Spanish (Catalan) origin, and Slavs.

**Japan.**—This ancient and extensive empire consists of four large and many small islands, said to comprise in all above 4,223, the principal of which are Honshu (the name of the empire being Nihon), Shikoku, Kiushu, Hokkaido or Yezo, situate to the north of the main island, from which it is separated by the Tsugaru straits, and Formosa, called by the Japanese Taiwan. In addition, the Russo-Japanese war gave to Japan the southern portion of the island of Sakhalin; while in 1910 Korea, a protectorate since the conclusion of the same war, was formally annexed.

**Surface.**—The islands of Japan appear to be the highest portions of a huge chain of mountains which rises from a deep ocean bed. This chain, though dotted with volcanoes, is not therefore itself of volcanic origin. Earthquakes occur very frequently in Japan, although the western slope is exempt. Japan is one of the most mountainous countries in the world.

Its plains and valleys, with their foliage of luxuriant richness, its forest-clad heights, its alpine peaks, towering above ravines noisy with waterfalls, its foam-fringed headlands, give it a claim to be considered one of the fairest portions of the world. The most sublime coast, the sacred Fujiama (Fujiyama), a rather dormant volcano, rises to a height of 12,365 feet; and there are six peaks between 8,000 and 10,000 feet (to be active volcanoes).

The three other large islands also abound in mountains. Yezo has eight active volcanoes. Throughout the empire there are solfataras, and sulphurous springs. The plains, most of the valleys, and many of the lower hills are highly cultivated.

**Rivers.**—The rivers are of no great length; Tonegawa, the longest, is only about 172 miles. Biva, in the south of Honshu, is the principal lake, being some 60 miles in length, with an extreme breadth of 20 miles.

**Climate.**—The climate ranges from an almost arctic cold in the north to a nearly tropical heat in the south. In the island of Yezo winter begins about October and continues to April, its winters being marked by severe frosts and snowstorms; while in Yokohama, and the winter is genial, with a bright sky and a temperature much like England. From July to September the thermometer often registers as high as 95° in the shade.

**Vegetable and Animal Life.**—The vegetation of Japan is very varied, in consequence of its wide range of temperature. The vegetation of the tropics is strangely intermingled with that of the temperate or frigid zone; the tree-fern, bamboo, banana, and palm grow side by side with the pine, oak, and beech, and conifers in great variety. The camellia, the Paulownia, and the chrysantheum are indigenous.

Wild animals are not numerous, but bears, wild boars, monkeys, deer, small foxes, stoats, and squirrels occur; and there are said to be varieties of the tiger, leopard, and the Japanese cat has only a stump of a tail. There are numerous water birds; land birds are less plentiful. Edible fishes, including salmon, are abundant, and insect life is especially varied.

**Cities.**—The capital is Tokyo, formerly called Yedo, the residence of the emperor. Other cities are Osaka, Kioto (the ancient capital), Kobe, Yokohama, and the cities of Saitama, Saki, Sendai. There are also nineteen other towns of between 50,000 and 100,000.

**People.**—The Japanese belong to the great Mongolian family, though ethnologists recognize more than one element in the population. They are generally distinguished by broad features, the chin-bone prominent, the eyes, obliquely set; long black hair, and a yellow or light-olive complexion; some are good-looking, and many are well-made, active men. They are a frugal, skillful, persevering, courageous race, who combine these characteristics with much frankness, good humor, and courtesy.

**Liberia.** a negro republic on the Pepper coast (Guinea) of West Africa, extending 500 miles northward and northeast of Cape Palmas, and reaching 200 miles inland.

**Surface.**—The coast region consists of mangrove swamps, lying behind a belt of sand dunes, is traversed by numerous rivers, and interrupted by projecting headlands of rock. About 20 miles or so inland the surface begins to rise into undulating uplands.

**Climate and Vegetation.**—The climate and vegetation are tropical; the temperature ranging between 75° F. and 88° F. The rainy season lasts about seven and the dry season five months. The chief products are palm oil, palm oil and palm kernels, cocoa, arrowroot, cashew, ivory, kola nuts, etc.

**People.**—These consist of liberated American slaves and their descendants, indigenous negroes, including the Kroomen.

**Cities.**—There are thirteen ports of entry along the 350 miles of coast, viz., Robertsport, Monrovia, Marshall, Grand Bassa, River Cressa, Greenville, Hanna, Kono, Harper, Half Cavalia, Jenebo, Grand Cess, and Garraway.

**Mexico** is a federal republic of North America, embracing twenty-seven states, a federal district, and two territories.

It extends between the United States and Guatemala, with an extreme length of nearly 2,000 miles; its breadth varies between 1,000 and 1,500 miles. The Gulf of Tehuantepec, 180 miles long, separates the two countries. The extremities of the republic there extend the peninsulas of Yucatan and Lower California, inclosing the gulfs of Campeche and California respectively.

**Surface.**—For the most part Mexico consists of an immense table-land, which commences in the United States, and rises to over 8,100 feet at Marquez, 16 miles north of the city of Mexico City; at El Paso, on the northern frontier, the elevation is only 3,717 feet. The most important range is the Sierra Madre (over 10,000 feet, and extending from Tehuantepec into the United States); parallel with this run the sierras of the east coast and of Lower California.

The surface of the country is also much broken up by short cross ridges and detached peaks, the principal being the Cordillera de Anahuac, culminating in Toluca, the highest point on the North American continent, and Popocatepetl. Most of the Mexican volcanoes are extinct or quiescent; violent earthquakes are of rare occurrence.

On the Atlantic side the plateau descends abruptly to the narrow strip (about 60 miles) of fertile alluvial coast land; toward the Pacific, where the coast lands vary in width from 40 to 70 miles, the descent is more gradual.

**Rivers.**—The largest river is the Rio Grande del Norte, forming part of the boundary with the United States; most of the others are rather insignificant. The lakes, which abound, are individually of little importance; some of them have no outlet.

**Climate and Vegetation.**—In the plateau region the climate is almost that of perpetual spring; but agriculture is dependent on irrigation, and the desert tracts are cultivated by the Chihuahuas and Zacatecos. On the coast lands wood and water are abundant, and the soil fertile, but the climate is such that white men cannot work as laborers there.

The coast belt and the terrace up to 3,000 feet constitute the *tierras calientes*, where the temperature ranges from 60° to 110° F., and in the south magnificent tropical vegetation, the tall rubber (Ficus) tree, the cold lands, or *tierras frias*, embrace all the country above 8,000 feet. South of about 28° north latitude

there are only the wet and the dry season, the former from June to October. Farther north there are four seasons.

The vegetation of Mexico has the same wide range as the climate. In the lowlands dye woods and valuable timbers abound in the virgin forests, as well as medicinal plants, india rubber, palms, etc.; and oranges and bananas are raised. The principal crops are wheat, maize, sugar, coffee, cotton, rice, indigo, cotton, and tobacco, besides the omnipresent maize, all thrive.

**Cities.**—The chief cities are Mexico (the capital), Puebla, Guadalupe, San Luis Potosi, Leon, Monterey, Pachuca, Zacatecas, Guanajuato, Merida, Queretaro, Morelia, Oaxaca, Orizaba, Aguascalientes, Saltillo, Durango, Chihuahua, Vera Cruz, Toluca, and Ocelaya.

**People.**—The proportion of the different races in the population is believed to be 20 per cent of pure whites, 43 per cent of mixed race, and the remainder Indian. The crooks or half-breeds (*mestizos*), are naturally the dominant race. The Spanish language is generally spread over Mexico.

**Monaco.**—A miniature principality on the Mediterranean, between France and Italy, consisting of the rocky town of Monaco, La Condamine, and Monte Carlo, where there is a gambling establishment, and comprising a narrow strip of country extending from the Monaco cemetery on the west to St. Roman on the east.

It is about 3 miles long and 1½ miles broad, with a yearly average of over 1,200,000 visitors. The whole available ground is built over, so that there is no cultivation.

**Montenegro** is a kingdom lying between Northern Albania on the south and Herzegovina on the north.

**Surface.**—Beyond the low coastal fringes, which has a climate like that of the south of France, comes a rugged mountain region ranging up to 5,500 to 8,000 feet, not in a series of chains but in a confusing mass of peaks and gigantic crags and blocks, wild gorges and natural caves, the bare, crystalline rock being everywhere visible.

**Rivers and Vegetation.**—The streams in some cases have underground channels. The center of the country is occupied by the branching valleys of the rivers Zeta and Moratcha, which flow south into Lake Scutari. East and north of them the mountains are well wooded, principally with beech and pine.

**Cities.**—The capital is Cetinje; other cities are Podgorica, Dulegnio, Niksic and Antivari.

**People.**—The Montenegrins belong almost entirely to the Serbian branch of the Slav race. They are a brave, warlike, and simple people, noted for their honesty and their chastity. They live in small stone houses, in small villages.

**Morocco, or Marocco,** is an empire or sultanate in that part of northwest Africa bounded on the east by Algeria and on the south by Cape Nun and the Sahara, though the north lies on the Sahara side of the Atlas the limits of the empire are rather indeterminate.

**Surface.**—Morocco is, as a rule, mountainous, the Atlas traversing it in several chains from southwest to northeast, and by various spurs both to the coast country and to the desert. There are, however, numerous level plains, some of which are fertile and very rich. Farther south, and on the other side of the Atlas, sandy wastes are the prevailing characteristic. In western Morocco, though the soil is sometimes thin, actual desert is rare.

**Rivers.**—The rivers are unimportant, being mostly dry for part of the year, and generally diminishing in volume as they approach the sea. The coast is fringed by a narrow strip, the most frequented are Tangier, El-Araish (Larache), Rabat, and Mogador.

**Climate.**—The climate in many parts is pleasant and temperate, in many others the summer heat is oppressive.

**Vegetable and Animal Life.**—The flora includes the excellent oak and cork oak; in the higher regions of the Atlas the cedar and Aleppo pine; the olive, the fig, the almond, and south of the Atlas. All the fruits of the south of Europe are cultivated to some extent.

Among the wild animals are the lion, panther, jackal, hyena, wild boar, gazelle, and several species of large antelope. The locust is a cause of much devastation. The ostrich is found on the southern frontiers. The spirited small horses for which the country was once famous are still numerous.

**Cities.**—Morocco has three capitals or imperial residences—Fez, Makinas or Mequinez, and Marrakech or the City of Morocco. Besides these the principal coast towns are Tangier, Tetuan, Larache (El-Arishi), Rabat, Sale, Casablanca, Maragan, Safi, and Mogador.

**People.**—The inhabitants consist of six principal groups—Berbers or Kabyles (Tuaregs, etc.), the aborigines, Arabs, Jews, a few thousand Spaniards, Moors (Arabs with an admixture of Spanish blood, living in towns, though the name is often given to all the Mohammedan inhabitants), and negroes.

**Netherlands, The, or Holland, a kingdom of Europe, lies on the North Sea north of Belgium and west of part of northern Germany. Its greatest length (north to south) is 185 miles, and its greatest breadth 110 miles. It is little more than one-tenth of the size of Great Britain and Ireland. Luxembourg was till 1890 connected with Holland.**

The country is divided into eleven provinces.

PROVINCES	AREA SQ. MILES	POPULATION DEC. 3, 1900
North Brabant.....	1,980	629,101
Gelderland.....	1,965	639,431
South Holland.....	1,166	1,433,277
North Holland.....	1,070	1,103,514
Zeeland.....	690	231,938
Utrecht.....	614	285,180
Friesland.....	1,282	262,912
Overijssel.....	1,291	379,814
Groningen.....	1,190	201,213
Drenthe.....	1,030	172,992
Limburg.....	850	334,586
Total.....	12,648	8,825,198

**Colonies.**—In addition to her European territories Holland possesses extensive colonies and dependencies in the Asiatic archipelago and America; including Java, Sumatra, great part of Borneo, Celebes, the Dutch East Indies, Surinam or Dutch Guiana, the West Indian islands of Curaçao, Saba, St. Eustatius, etc.

**Surface.**—The Netherlands (or Low Countries, as the name implies) form the lowest, fertile portion of the great plain of northern and western Europe. It is the lowest part of this immense level, some portions of it being 10 to 20 feet below the surface of the sea, and nearly all parts too low for natural drainage.

The coast line is very irregular, being marked by the great inlet of the Zuider Zee, as well as by various others, and fringed by numerous islands. In great part the coast is so low that were it not for massive sea dikes large areas would be inundated and lost to the inhabitants. In the interior also dikes are a common feature, being built to protect portions of land from the lakes or rivers, or to enable swamp pieces of land to be reclaimed by draining, the water being commonly pumped out.

Almost the only heights are the sand hills, about 100 to 180 feet high, forming a broad sterile band along the coast of South and North Holland, and a chain of low hills, of similar origin perhaps, southeast of the Zuider Zee.

**Rivers.**—The principal rivers are the Rhine, Maas, and IJssel, with the mouths of the Schelde. Many canals, regulated by locks, connect the rivers, and the IJssel forms a link between the Rhine and the canals and mews of Friesland. Thus it is possible to travel on water through the whole of Holland.

**Climate.**—The climate of Holland is much like the climate of England, especially in its frequent and rapid changes; but, as a rule, the Dutch summer is hotter and the Dutch winter colder. April is about equivalent in the low-lying regions of the west.

**Cities.**—The four largest towns are Amsterdam, Rotterdam, the Hague, Utrecht, each with over 100,000 inhabitants.

**People.**—The great majority of the inhabitants are descendants of the old Batavians, or Teutonic stock. They comprise over 70 per cent of the population, and are chiefly

settled in the provinces of North and South Holland, Zeeland, Utrecht, and Gelderland. The languages of North Brabant, Friesland, and the Frisians, inhabiting Friesland, Groningen, Drenthe, and Overijssel, form the other groups.

**Norway** is a country in the north of Europe, bounded to the northeast by Russia, to the east by Sweden, and washed on all other sides by the sea—the Arctic Ocean on the north, the Atlantic and the North Sea on the northwest, and the Baltic and the Skagerrack on the south. It is about 1,080 miles in length, and its greatest breadth is about 275 miles, but toward the north it narrows so much as to be in some places not more than 20 miles.

It is divided into 20 provinces, or amts, as follows:

AMTS	AREA ENGLISH SQ. MILES	POPULATION DEC. 3, 1900
Christiania.....	6 4	227,626
Akershus.....	2,017 0	116,228
Bombesund.....	1,068 0	146,886
Hedemarken.....	10,600 1	126,182
Kristian.....	9,783 3	116,280
Busk.....	5,721 1	12,676
Jarlsberg and Larvik.....	895 6	104,534
Nedre.....	5,961 9	92,862
Narvik.....	3,699 9	19,935
Lister and Mandal.....	2,804 9	81,867
Svalbard.....	3,351 9	16,000
Sondre.....	6,028 0	257,752
Bergen (town).....	2 2	72,251
Rodre Bergenhus.....	7,136 1	150,041
Sondre Trondhjem.....	7,185 3	135,282
Nordre Trondhjem.....	10,400 4	135,282
Nordre.....	11,804 0	152,144
Troms.....	10,134 2	74,362
Finnmark.....	17,917 2	76,252
Total.....	124,129 7	2,240,032

**Surface.**—The coast consists chiefly of bold precipitous cliffs, and is remarkable both for the innumerable islands by which it is lined, and the bays or fjords which cut deeply into it in all directions. The surface is very mountainous, particularly in the west and north. Very commonly the mountain masses assume the form of great plateaus or tablelands, called *fjelds* or *fjells*, as the Dovre fjeld, Hardangere fjeld, etc. The highest summits belong to the Sogne fjeld, a series of elevated masses, glaciers, and snow fields in the center of the southern division of the kingdom, where rise Galdhøpiggen, Glittertind, and Skagstøtind. Immense snow fields and glaciers are a feature of Norwegian scenery.

**Rivers.**—The few important rivers that Norway can claim as exclusively her own have a southerly direction, and discharge themselves into the Skagerrack; of these the chief are the Glommen (400 miles), and its affluent the Lofoten. The most important river in the north is the Tanen, which forms part of the boundary between Russia and Norway, and falls into the Arctic Ocean. Lofty waterfalls are numerous. Lakes are extremely numerous, but generally small. The principal is the Mjøsen Vand.

**Vegetable and Animal Life.**—The forests are estimated to cover about a fifth of the whole surface, and form a very important branch of national wealth. The principal forest tree is the pine.

The reindeer forms the principal stock in the extreme north. Among the larger wild animals are the wolf, bear, elk, and deer. The fisheries are of very great value; they include the cod, herring, mackerel, salmon, shark, walrus, seal, and lobster, the cod and herring (chiefly) being by far the most important. The rivers and lakes abound with salmon and salmon-trout, and make Norway one of the best angling countries in the world.

**Cities.**—The chief cities are the capital, Christiania, and Bergen. Other important towns are Trondhjem, Stavanger, and Drammen.

**People.**—The people are almost entirely of Scandinavian origin. A small number of Finns (chiefly in Norway) and Quenes (a Finnish people) dwell in the northern parts. The Norwegian language is radically identical with the Icelandic and with the Danish. For centuries Danish was generally

employed as the literary and educated language of the country, as it still is; but during the last century a very decided literary movement has sprung up, claiming to employ the national language—has sprung up.

**Oman, or Muskat,** is a sultanate in the southeast of Arabia, partly on the Persian gulf, partly on the eastern coast of Africa. It has been considerably reduced during the last hundred years.

**General Features.**—The chief features of the country are a series of barren sand and rock mountains, reaching the height of 10,000 feet; fertile valleys and plains, yielding abundance of grain, sugar, fruits, cotton, coffee, etc., Oman being the richest part of the Arabian peninsula in agricultural products and in mineral treasures.

The inhabitants are tolerant, but very superstitious and immoral. They are mostly Arabs, but there is a considerable mixture of Persians, Hindus, Africans, and others.

**Panama.**—The republic of Panama was constituted on Nov. 3, 1903, having previously been a department of the republic of Colombia.

The country is divided into 7 provinces, each under a governor, with other subordinate officials. The chief ports are: on the Atlantic—Colon (Cristobal (old name)), Bocas del Toro, and Puerto Bello; on the Pacific, Balboa (in canal zone) and Pedregal.

The railway runs from Colon to Panama across the isthmus, and is the chief artery, and belongs to the United States government, as does the canal zone, which extends 6 miles on each side of the canal, except the cities of Panama and Colon at the ends. The population of the canal zone is 54,036. The soil is very fertile, but not well cultivated. Bananas are exported, and some rubber, coconuts, and hides.

The modern city of Panama, the capital, is the chief city. The majority of the population are of Indian and negro descent, and half-breeds.

**Paraguay,** a republic of South America, surrounded by the Argentine republic, Brazil, and Bolivia, separated from the west by the River Paraná, its tributary the Paraguay, and the Pilcomayo, a tributary of the latter; from Brazil by the Paraná, a range of hills, and the Apa, a tributary of the Paraguay.

**Surface and Climate.**—The northern portion of Paraguay is in general undulating, covered by low, gently-swelling ridges, separated by large grass plains, dotted with palms. There are mountains in the northeast and northwest corners. The southern portion is one of the most fertile districts of South America, consisting of hills and gentle slopes richly wooded, of wide savannas, which afford excellent pasture-ground, and of rich alluvial plains, some of which are marshy, but a large proportion are of extraordinary fertility and highly cultivated.

The temperature occasionally rises to 100° in summer, but in winter is usually about 45°.

**Vegetable and Animal Life.**—The banks of the rivers Paraná and Paraguay are occasionally better wooded, but in general the lowlands are destitute of trees.

The natural fertility of the soil is shown by a vegetation of almost unequalled luxuriance and grandeur. In the forests are found at least six varieties of timber trees, besides dye-woods, gums, drugs, perfumes, vegetable oils, and fruits. Many of the hills are covered with the *proba mait* or Paraguay tea.

The large plains are roamed over by immense herds of cattle.

Tapirs, jaguars, pumas, ant-eaters, wild boars, peccaries, and deer abound; birds are also numerous; the most characteristic fish, and their banks are the resort of alligators and coypus. Snakes, including enormous boas, are numerous, but very few of them are venomous.

**Cities.**—The capital is Asuncion; other towns are Villa Rica, Concepcion, San Pedro, Luque, Carapegua, Paraguari, and Villa del Pilar.

**People.**—The population of Paraguay is composed of whites of Spanish descent, Indians, a few negroes, and a mixture of races. Trade in the towns is almost wholly in the hands of Italians, French, and Germans.

**Persia**, called by the natives Iran, the most important native kingdom of western Asia, is bounded by Russian Caucasasia, the Caspian Sea, the Russian Transcaucasian provinces, Afghanistan, Baluchistan, the Straits of Ormuz, the Persian gulf, and Asiatic Turkey. It extends 900 miles from east to west, and 700 miles from north to south.

**Surface**.—Persia is an elevated plateau, broken by clusters of hills or chains of rocky mountains, which alternate with extensive plains and barren deserts; the desert of Khorassan in the northeast alone absorbs about one-seventh of the entire area. Low tracts exist on the Persian gulf and the Caspian.

The interior plains have an elevation of from 2,000 to 6,000 feet above the sea. This vast central plateau is supported in the north and south by two great mountain chains or systems, and from these all the minor ranges seem to spring.

The north chain, an extension of the Hindu Kush, enters Persia from northern Afghanistan, proceeds across the country, and reaches its greatest elevation at the south of the Caspian, where it takes the name of the Elburz mountains, and attains at Mount Demavend a height of nearly 20,000 feet. Still farther west it becomes linked with the mountains of Ararat. The other great mountain system runs from north to south, nearer the Persian gulf, is of considerable width, and forms several separate ranges. In one of these an elevation of 17,000 feet is reached.

**Rivers**.—The rivers are few and insignificant. Not one of them affords any navigable importance, except the Euphrates, which only waters a small portion of the southwest frontier, and the Karun, recently opened to the navigation of the world. The latter is entirely within Persian territory, and flows into the Shat-el-Arab, or united Tigris and Euphrates. Of the streams which flow northward into the Caspian the only important one is the Kizil, or Red, and (White river), which has a course of about 350 miles. There are a great number of small fresh-water lakes, and a few very extensive salt lakes, the largest being Urmiah in the extreme northwest.

**Climate**.—The climate varies considerably in different provinces, and in the central plateau intense summer heat alternates with extreme cold in winter. The shores of the Persian gulf are scorched up in summer; those of the Caspian Sea, especially the parts covered with dense forest, are humid, but also noted for malaria.

**Animal and Vegetable Life**.—The forests of the Elburz swarm with wild animals, as wolves, tigers, jackals, boars, buffaloes, foxes, and the Caspian cat. Leopards abound in Mazandaran, and lions in parts of Fars and Arabistan. The horses have always been celebrated for their beauty, speed, and endurance. The Caspian rivers abound with fish, especially sturgeon.

Some parts of the country are of exceeding fertility and beauty; the immense valleys, some of them 100 miles in length, between the various ranges of the Kerman mountains, abound with the rarest and most valuable vegetable products.

**Cities**.—Teheran is the capital; chief trade centers: Teheran, Tabreez, Isfahan; chief ports, Bushire and Bender Abbas on the Persian gulf. Other large towns are Meshed, Balfoorch, Kerman, Yezd, Hamadan, Shiraz, Kasvin, Kom, Reht.

**People**.—The settled population are chiefly Tajiks, the descendants of the ancient Persians, race, with an intermixture of foreign blood. To this class belong the agriculturists, merchants, artisans, etc. The Tajiks are Mohammedans of the Shiite sect, with the exception of the remaining Parsees who are found chiefly at Yezd, and still retain their purity of race and religious faith. The nomad, or pastoral tribes, are of four distinct races—Turks (not Osmanli Turks), Kurds, Arabs, and Afghans. Of the latter, the Turks is the most numerous, and to it belongs the present Kajar dynasty.

**Peru**.—A republic of South America, bounded on the north by Ecuador and Colombia, on the west by the Pacific, on the south by Chili, on the east by Bolivia and Brazil.

**Surface and Climate**.—The coast extends from the base of the Andes to the Pacific Ocean, and consists of a sandy desert covered by some forty rivers along whose banks there are fertile valleys; the sierra, or region of the Andes, about 250 miles wide, contains stupendous chains of mountains, elevated plains and table-lands, warm and fertile valleys and ravines; and the *montana*, skirted by the steep slopes of the Andes, consists of tropical forests traversed by great tributaries of the Amazon. Since 1570 there have been seventy destructive earthquakes recorded on the west coast, including those of 1665 and 1877.

The Peruvian Andes attain 22,000 feet. From November to April there is usually continuous dryness on the coast, from September the sky is obscured for weeks by mists, sometimes accompanied by drizzling rain. The maximum temperature is about 78° in summer and 60° in winter.

The valleys and plateaus between these ranges form the Sierra of Peru, and include every variety of climate and scenery. They may be divided into four sections, commencing from the north; in the third is Cuzco, the capital of the Inca; while the fourth section is the basin of Lake Titicaca, about 150 miles in length and breadth. The lake itself is 80 miles long, and 12,874 feet above the level of the sea. The Sierra of Peru is the original home of the potato.

**Animals**.—The animals which specially belong to the Peruvian sierra are the domestic llama and alpaca, and the wild vicuña, the viscacha, the chinchilla, deer, dogs, and foxes; notable among birds are the condor and the flamingoes, geese and wading birds of Lake Titicaca. The fauna of the forests also includes monkeys, badgers, bears, pumas, jaguars, tapirs, wildcats, deer, and many rodents; with curassows, ibises, cranes, spoonbills, parrots, toucans, and many snakes.

**Vegetation**.—The *montana* is the region of tropical forests within the basin of the river Amazon; the forests drained by the Marañon, Ucayali, and Ucayali form the northern portion. The whole length of the *montana* from the Marañon to the Bolivian frontier is 800 miles. The subtropical portion, comprising the eastern slopes of the Andes, is the region of the cinchona trees, and of the cocoa, and here coffee and cacao of the finest quality are cultivated. From the forest-covered plains come india-rubber, sarsaparilla, and a great variety of useful and ornamental timber.

**Cities**.—The principal towns are Lima (the capital), Arequipa, Cusco, and Truxillo; principal ports, Callao (port of Lima), Molendo (port of Arequipa), and Truxillo.

**People**.—The population consists of about 57 per cent aboriginal Indians, 23 per cent mixed Indian races, and 20 per cent of descendants of Spaniards. European chiefly Italians, French, and Spaniards, and Asiatics (chiefly Chinese).

**Portugal**, a republic (since 1910) of Europe, lying mainly between the Atlantic and the west side of the Iberian peninsula, stretches 350 miles from north to south, and varies in width from 70 to 140 miles. The area is a little larger than Ireland.

The six best provinces are Minho, Trás-os-Montes, Beira, Estremadura, Alentejo, and Algarve; to which are to be added the Azores and Madeira, always reckoned not colonies but as parts of the mother country.

**Colonies**.—The colonial possessions of Portugal, situated in Africa and Asia, are as follows:

COLONIAL POSSESSIONS	AREA SQUARE MILES	POPULATION
<i>Possessions in Africa:</i>		
Cape Verde Islands (1900) . . . . .	1,480	147,424
Sierra Leone (1900) . . . . .	13,940	320,000
Prince's and St. Thomas Islands (1902) . . . . .	360	42,163
Angola (1900) . . . . .	484,800	4,118,000
Mozambique (1900) . . . . .	293,400	3,120,000
East Africa . . . . .	793,960	8,248,527

COLONIAL POSSESSIONS Continued	AREA SQUARE MILES	POPULATION
<i>Possessions in Asia:</i>		
In India—Goa (1900) . . . . .	1,409	475,513
Daman, Diu (1900) . . . . .	109	56,285
Indian Archipelago (Timor, etc.) . . . . .	7,330	300,000
China—Macao, etc. (1900) . . . . .	4	61,591
Total, Asia . . . . .	8,972	866,739
Total, Colonies . . . . .	802,952	9,144,316

**Surface**.—Portugal is only partially separated from Spain by natural boundaries. The surface is occasionally bold, and rises to a great height; but the far greater part is low and marshy, and not infrequently lined by sands and reefs, which make the navigation dangerous.

The interior is generally mountainous, a number of ranges stretching across the country, forming a succession of independent river basins, while their ramifications form the watersheds of numerous subsidiary streams, and inclose many beautiful valleys. The loftiest range is the Serra da Estrela, a continuation of the central chain stretching across Spain, which attains the height of 7,324 feet. The nucleus of the mountains is usually granite, especially in the north and middle.

**Rivers**.—No rivers of importance take their rise in Portugal. The Minho in the north, the Douro, and the Tagus all flow from east to west. The Guadiana is the only large river which flows mainly south. Portugal can only claim as peculiarly her own the Vouga, Mondego, and Sado.

**Climate**.—The vicinity to the ocean tempers the climate, and exempts it from the dry heat of Spain. The inequalities of the surface produce, however, diversities of climate; for, while snow falls abundantly on the mountains in the northern provinces, it is never seen in the southern lowlands. Rain falls abundantly in the south, the east, and west, and fever prevails in the low flat lands and near the salt marshes.

**Vegetation**.—Few countries have a more varied flora than Portugal. The number of species has been estimated to exceed 4,000, and of these more than 3,000 are phanerogamous. Many of the mountains are clothed with forest trees, among which the common oak and the cork oak are conspicuous. In the central provinces chestnuts are prevalent; in the south both the date and the American aloë are found; while in the warmer districts the orange, lemon, and olive are cultivated with success. The mulberry affords food for the silkworm, and a good deal of excellent silk is produced.

**Cities**.—The chief towns are Lisbon, Oporto, Braga, Setúbal, Funchal (Madeira), Coimbra, Ponta Delgada (Azores), and Évora.

**People**.—The Portuguese are a mixed race—originally Iberian or Basque with later Celtic admixture. Jewish and Arabic blood are strongly present in the center, and African in the south. The Portuguese differ widely from the Spaniards.

**Romanians**.—A kingdom in southeast Europe, lying mainly between the Carpathians, the Pruth, and the Danube, and bordering on Hungary, Russia, Bulgaria, and Servia. It is crescent-shaped, and has a circumference of 358 miles and a breadth of 190 miles.

**Surface and Rivers**.—The surface is mainly occupied by undulating and well-watered plains of great fertility, gradually sloping upward to the Carpathians on the north and west borders, where the summit range from 2,650 to 8,800 feet above sea-level.

The entire kingdom is in the basin of the Danube, which has a course of 985 miles in Rumania, forming the boundary with Bulgaria nearly the whole way. Its chief Rumanian tributaries are the Oita (or Aluta), Ardia, Jalomita, Sereth, and Fruth (or Siret). The border of the Danube forms a number of marshy lakes as it approaches the alluvial region of the Dobrudda, through which it discharges itself into the Black Sea by the St. George, Sulina, and Kilia mouths. **Climate**.—The climate is much more extreme than at the same latitude in other parts of

Europe; the summer is hot and rainless, the winter sudden and very intense; there is almost no spring, and the autumn is long.

**Cities.**—The capital of Roumania is Bukharest in Wallachia, about 30 miles from the Danube; and the chief town of Moldavia is Jassy, near the Pruthi. Other towns are the suburbs of Galatz and Ibrail (or Braila) at the mouth of the Danube, Craiova (Krajoa), Botosani, Ploiesti (Ploeschti), Pitesti, and the ancient capital Curtea d'Ardeaz.

**People.**—The Roumanians are descended from the ancient inhabitants—probably Thracians or Dacians—of the country, modified by elements derived from the Roman, Gothic, Bulgarian, and Slavonic invaders. They include many Jews, and gypsies.

**Russia.** a great empire, is second in area only to the British empire, and third as regards population, the Chinese empire ranking first, the British second. It comprehends most of eastern Europe and all northern and part of central Asia.

The following table exhibits the area and population according to the last issue of the Russian central statistical committee in 1900:

GOVERNMENTS AND PROVINCES	AREA ENGLISH SQUARE MILES	POPULATION 1905	DENSITY PER SQ. MILE
1. European Russia.....	1,862,524	113,841,000	61.0
2. Poland.....	49,018	12,660,000	257.7
3. Ciscaucasia.....	85,201	4,601,200	54.0
Total, Russia in Europe.....	1,996,743	129,803,100	65.0
4. Trans Caspian.....	95,462	95,000	66.1
5. Siberia.....	4,786,730	7,347,200	1.5

**Surface.**—The leading feature in the physical structure of European Russia is a broad, flat, swelling about 700 feet above sea level, with an average height of 800 feet, which crosses it from southwest to northeast and connects the elevated plains of middle Europe with the Urala. A belt of lowlands stretching from east Prussia to the Caspian Sea fringes this central plateau on the northwest, separating it from the hilly tracts of Finland; while the plains of Bessarabia, Kherson, the Sea of Azov, and the lower Volga limit it on the southeast.

The central plateau is diversified by three or four depressions. The Urala, which separate the lowlands of European Russia from those of Siberia, consist of a series of parallel ridges running southwest to northeast, their chief summits reaching 4,950 to 5,100 feet high.

Beyond the Urala in Asiatic Russia are the vast Siberian plains slightly inclining to the north, and becoming mountainous in some parts toward the south and east. Great swamps are areas toward the Arctic Ocean are known as *tundras*. Part of the Thian Shan mountains and of the Altai mountains, on the boundary between the Russian and Chinese empires, belong to Siberia.

**Rivers and Lakes.**—European Russia is watered by numerous and important rivers, some of great magnitude and running a course of 1,000 to 2,000 miles. The Volga, the Mezen, Northern Dvina, and Onega are the principal rivers of European Russia which send their waters to the Arctic Ocean; the Neva, Duna, Niemen, and Vistula belong to the Baltic basin; the Black Sea basin comprises the Pruth, Dniester, Dnieper, and the Don; whilst the Caspian receives, besides other rivers, the Ural and the Volga, the latter the largest of all European rivers.

Asiatic Russia has also a number of very large rivers, as the Obi, Yenisei, and Lena in Siberia, and the Amur toward the Chinese frontier. This great river system is of incalculable value to Russia, as by its means internal communication is carried on. Canals connect the navigable rivers, so as to form continuous water-ways. River steam navigation has been much developed of recent years.

The lakes are also on a gigantic scale. Lake Ladoga, near St. Petersburg, is the largest in Europe. Other large lakes in

Europe are those of Onega, Peipus, and Ilmen. In Asia there is the Sea of Aral, larger than any of the former mentioned, followed by Baikal, Balkhash, and others. The Caspian Sea now also forms a Russian lake. From the extent of the plains and steppes, the swamps, moors, desert wastes, and forests of Russia the scenery as a whole is very mountainous.

**Climate.**—All over European Russia, except in the Baltic provinces, the south of the Caucasus, and the southern shores of the Black Sea, the climate is continental. A very cold winter, followed by a spring which sets in rapidly; a hot summer; an autumn cooler than spring; early frosts; and a small rainfall, falling during the summer and the autumn, are the main features. The winter is cold everywhere. All over Russia the average temperature of January is below the freezing point, and it only varies between 22° F. in the west and 5° to 7° in the east. All the rivers are frozen over early in December, and they remain under ice for from 100 days in the south to 160 in the north. In summer the temperature is high all over Russia, and reaches 78° at Astrakhan.

**Vegetable Life.**—The flora of Russia marks four regions: (a) the arctic tundras are chiefly covered with mosses, lichens, and low shrubs; (b) the forest region, which covers the whole of northern and middle Russia, is either forest-forest proper or prairies dotted with forests; (c) the steppe, or immense plains covered with grass, and devoid of forests. (d) The flora of the Mediterranean region occupies a narrow strip along the southern coast of the Crimea.

**Animal Life.**—The fauna of European Russia is very much like that of middle Europe. Among wild animals are the bear, the wolf, wild hog, elk, and various animals which are hunted for their fur. Both on the coasts and in the rivers a great number of productive fisheries are carried on. In the Arctic Ocean vast numbers of seals are taken. The rivers, particularly the Caspian and Volga, of Asov, particularly the Ural and Volga, are celebrated for their sturgeon. In the same quarters are also important salmon fisheries. In the regions bordering on the Arctic Ocean large numbers of reindeer are kept in the south, among the Tartars of the Crimea and the inhabitants of the Caucasus, the camel is often seen.

**Cities.**—The largest towns are St. Petersburg (the capital), Moscow, Warsaw, Odessa, Lodz, Riga, Kiev, Kharkov, and Tiflis.

**People.**—Russia contains many different peoples. The Russians form the main body of the Slavonic race. The number of Slavs is fully 92 millions, including over 7 million Poles. There are over 3 million Lithuanians, fully 1,800,000 Germans, nearly 1,200,000 Armenians, over 5 million Jews, nearly 6 million Finns, over 13½ million Turco-Tartars, 2½ million Cossacks, and other Caucasian races, besides various minor races.

**San Marino.** a small republic, founded in 400, near Rimini, on the Adriatic, founded, it is stated, by a pious mason of Dalmatia in the fourth century, and governed by a council of 60, of whom two are elected as regents in the northeast of the Balkans in the south, the population 10,480. There is an army of about 1,000. The city of San Marino (population 1,500) occupies the slope of Mount Titian, and has an impregnable citadel, where King Berengar of Lombardy took refuge in 950 A. D., a fine church and government palace, and a theater. Agriculture and viticulture flourish.

**Servia.** is a kingdom of the Balkan peninsula, south of the Danube, and borders on Bosnia, Hungary, Roumania, Bulgaria, and Turkey.

**Surface.**—The surface is elevated and is traversed by ramifications of the Carpathians in the northeast, of the Balkans in the south, east, and of the Dinaric Alps in the west. The summits seldom exceed 3,000 feet, though the highest reaches 6,325. The whole surface belongs to the basin of the Danube, which receives the drainage partly directly, and partly by the frontier river Save, augmented by the Drin and the Timok, but chiefly by the Morava, which flows through the center of the kingdom.

**Climate.**—The climate is somewhat rigorous in the elevated districts, but mild in the valleys and plains, where there are extensive forests and uncultivated wastes.

**Cities.**—The principal towns are Belgrade (the capital), Nis, Kragujevatz, Leskovatz, Surdevatz, Shabatz, Vranje, and Pirot.

**People.**—The Servians are a well-built, stalwart Slavonic race, proud and martial by temperament. The population includes 46,000 Gypsies, and 20,000 of other nationalities. Besides the Servians there are also a number of pure Servians by race, as are also the Bosnians and Herzegovinians.

**Slam** occupies the central portion of the Indian business peninsula, stretching a distance of nearly 1,100 miles; greatest breadth 750 miles.

**Surface.**—The Malay peninsula excluded, the plain of the Menam valley, the adjoining eastern coast, and the Korat plateau (from 400 to 1,000 feet high) occupy the greater portion of the country. These plains are fringed by hills up to 5,000 feet high, and the north generally is hilly.

**Rivers.**—The Menam, with a course of 600 miles, is the principal river. Two other streams, the Meklong and the Bangpakong, flow into the Gulf of Siam. The Meklong has the main part of its course in the Siamese territory, but navigation for vessels of any size is impeded by rapids. The rivers form the principal trade routes, and in and around Bangkok there is intricate network of canals. Only the land adjoining the rivers is under cultivation, and the greater portion of the country is covered by pathless jungle.

**Vegetable and Animal Life.**—The forests produce almost wood, sappan wood, teak timber, bamboos, rattans, gutta-percha, dammar, catechu, benzoin, etc. Cocoa and areca palms are numerous in Siam; fruits are abundant and of excellent quality; black pepper, tobacco, cardamoms, and gamboge are important products.

Among wild animals are the tiger, leopard, bear, rhinoceros, gaur, golang, and horn-billed rhinoceros, and elephant, which here attains a size and beauty elsewhere unknown. The last, when of a white color, is held in the highest reverence. The forests abound with peacocks, pheasants, and pigeons, and in the islands are large flocks of the swallows that produce the famed edible birds'-nests. Crocodiles, geckos, and other kinds of lizards, and the cobra, are numerous. The python attains an immense size, and there are many species of snakes.

**Climate.**—The climate is considered healthy for the tropics; low malarial fever is the most frequent illness in the European community. There are two seasons—the wet and the dry, the former lasting from May till November. The average temperature for the year is 81°.

**Cities.**—The capital and commercial center of the kingdom is Bangkok. Other less notable places are Puket, Korat, Pooknam, and Narathiwat.

**People.**—The Siamese are members of the great Mongolian family, and of the same race as the people of Burma and Annam. In stature they do not average more than 5 feet 3 inches in height, they have a lighter-colored skin than the western Asiatics, but darker than the Chinese. They are generally vain, indolent, superstitious, and cowardly, but polite, cheerful, hospitable, and tolerant.

**Spain** occupies the larger part of the southwestern peninsula of Europe, and is bounded by the Bay of Biscay, the Pyrenees, the Mediterranean, the Atlantic, and Portugal. From Fuenterrabia in the north to Cape Tarifa in the south is 560 miles, and from Cape Finisterre in the northwest to Cape Creus in the northeast is 650 miles.

**Surface.**—The interior is considerably diversified, but its characteristic feature is its central table-land, which has an elevation of from 2,200 to 2,800 feet, and a superficial extent of not less than 90,000 square miles. It descends gradually toward the north and Portugal, but on the east, toward the provinces of Catalonia and Valencia, it presents an abrupt step or line of cliffs, with the character of an ancient sea margin. It is bounded on the north by the Asturian and



Cantabrian mountains, reaching an elevation of about 8,500 feet; on the south by the Sierra Morena; and is crossed from east to west by the rivers Douro, Tagus, and Guadiana. Between these little ranges are intersected by two important ranges of mountains running nearly east and west, the northern being the Guadarrama with its continuations, separating the valleys of the Douro and Tagus, and attaining in one of its peaks a height of 8,200 feet; and the southern, the Sierra de Toledo, and its continuations, between the Tagus and the Guadiana.

South of the Sierra Morena is the valley of the river Guadalquivir. Besides these ranges there is the chain of the Pyrenees, which, though partly belonging to France, presents its highest and its loftiest summits within it. The highest peak in this range is La Maladetta, or Pic de Nétou; but the highest peak in Spain is Mulhacén, belonging to the Sierra Nevada in the south.

The latter chain possesses some of the wildest scenery in Europe.

**Rivers.**—The chief rivers enter the Atlantic, but in the northeast is the Ebro, an tributary of the Mediterranean. The Douro, Tagus, and Guadiana belong partly to Portugal. The lakes are few and unimportant.

**Cities.**—There are two cities with over 400,000 inhabitants, Madrid and Barcelona; others of importance are Valencia, Seville, Malaga, and Murcia.

**People.**—The people of Spain are of very mixed origin, the most and the inhabitants of the Iberians (now represented probably by the Basques or Biscayans of the northeast), being afterward mingled with Celtic, Phœnician, and Caucasian, and Roman colonists, Goths, Jews, and Arabs or Moors. They are generally of medium height and of spare habit, with black hair, dark eyes, and sallow complexion.

**Sweden,** a kingdom in the north of Europe, forms with Norway the great Scandinavian peninsula. It consists of the three great divisions of Svealand, or Sweden proper, in the middle, Gotland, or Gothland, in the south, and Norrland in the north.

**Surface.**—The country may be generally described as a broad plain sloping southward from the Kjolen mountains to the Baltic. The only mountainous district adjoins Norway; the peaks sink in altitude from 7,000 to 3,800 feet. Immediately south of this point a subsidiary chain strikes off to the southeast, and, threatening the lake region of central Sweden, swells out beyond into a table-land with a mean elevation of 850 feet and maximum of 1,240 feet. Fully two-thirds of the entire surface lies lower than 800 feet, and one-third lower than 300 feet, above sea-level.

**Rivers and Lakes.**—The rivers and lakes are very numerous. To the Baltic basin belong the Tornea, the Lulea, Umea, the Angermana, the Ljusne, and the Gäddede. The principal rivers belonging to the basin of the German Ocean are the Klar and the Göta. In general the rivers are useless for navigation, and the chief natural means of communication are the lakes, the chief of which are Lake Wener (area, 2,014 square miles), Lake Wetter (715 square miles), and Lake Malär, which has the capital on its shores. By canal, lake, and river there is an inland waterway—the Göta canal—from the Kattegat to the Baltic.

**Climate and Animals.**—There is hardly any spring or autumn intervening between the heat of summer and the cold of winter, which in the north lasts for nine, and in the south for seven months. The extremes of heat and cold are much greater than in Britain, but on the whole the climate is eminently favorable to health. Among the larger wild animals are the wolf, bear, elk, red and roe deer, lynx, gibbon, fox, and even the beaver. Among birds the most remarkable are eagles, the eagle-owl, and the capercaillie. The rivers and lakes are well stocked with salmon and trout.

**Cities.**—These include Stockholm (the capital), Gothenburg, Malmö, Norrköping, Gäfle, Helsingborg, Karlskrona, Jönköping, and Örebro; and twelve more exceeding 10,000.

**People.**—The inhabitants of Sweden, with the exception of the Laplanders, numbering about 7,000, and the Finns, numbering about 20,000, found only in the north, belong to the Scandinavian branch of the Teutonic family, and are characterised by a tall, robust build, light hair, blue eyes, and light complexions.

**Switzerland** is a confederation or republic of cantons, and is geographically divided into half-cantons, situated in the center of Europe between France, Germany, Austria, and Italy. The greatest length east to west is 216 miles, the width being 137 miles.

**Surface.**—The characteristic physical features of Switzerland are its lofty mountain ranges, enormous glaciers, magnificent lakes, and wild romantic valleys. The loftiest mountain chains belong to the Alps, and are situated chiefly in the south.

The central nucleus is Mount St. Gothard, which unites the principal watersheds of Europe, and sends its waters into four large basins—north by the Rhine to the German Ocean, south by the Rhodanus into the Mediterranean, southeast by the Po to the Adriatic, and east by the Danube to the Black Sea. In like manner it forms a kind of striding point for the loftiest ranges of the Alps—the Helvetic or Lepontine Alps, to which it belongs itself; the Pennine Alps, which include Mont Blanc, the culminating point of Europe, extending beyond the Swiss frontier into Savoy; and the Rhaetian Alps, which stretch east and northeast across the canton of Grisons into the Tyrol.

North of the Alps is the chain of the Jura, and between the two is a sort of upland plain, or wide irregular valley, the most populous part of the country.

**Rivers and Lakes.**—Owing to the mountainous nature and island position of the country, the rivers of the Swiss aqueduct are in their limits as to become of much navigable importance. The Rhine, formed by two head-streams in the canton of Grisons, flows north into the Lake of Constance, and thence westward to the North Sea, rising in the celebrated falls of that name. Below these falls its navigation properly begins. Its principal affluent in Switzerland is the Aar, which rises in the canton of the same name (Valais), flows northwest into the Lake of Geneva. Immediately after issuing from the lake at the town of Geneva it receives the Arve, and about 10 miles below quits the Swiss frontier. The waters which the Po receives from Switzerland are carried to it by the Ticino; those which the Danube receives are carried to it by the Inn.

The largest lakes that of Geneva in the southwest and of Constance in the northeast, as well as that of Maggiore on the north side of the Alps, belong partly to other countries; but within the limits of Switzerland, and not far from its center, are Lake Neuchâtel, with Morat and Biann in its vicinity, Thun with its feeder Brienz, Lucerne or Vierwaldstätter-see, Sempech, Baldeg, Zug, Zürich, and Wallenstätter-see. All the mountain lakes belong to the basin of the Rhine.

**Climate.**—Owing to differences of elevation the climate is extremely variable even in the same locality.

**Cities.**—The largest towns are Zürich, Basel, Geneva, and Bern, the last being the federal capital.

**People.**—The Swiss are a mixed people as to race and language. German, French, Italian, and a corrupt kind of the Latin, called Romansh or Roumanch, are spoken in different parts. German is spoken by the majority of inhabitants in fifteen cantons, French in five, Italian in one (Ticino), and Romansh in one (the Grisons).

**Turkey** is a Mohammedan state of south-eastern Europe and western Asia, under the rule of a sultan. In Europe it occupies a small portion of the Balkan peninsula, but the larger part of Turkey is in Asia. A number of islands in the Ægean belong to Turkey. Crete and Samos are autonomous. Egypt too is nominally part of the Turkish dominions.

In 1908 Bulgaria declared its independence

of Turkey, and Bosnia and Herzegovina were definitely annexed by Austria-Hungary. **Surface and Climate.**—European Turkey is traversed in different directions by numerous mountainous chains, but the main systems are the Balkan range, stretching from west to east between Bulgaria and eastern Roumelia to Cape Kaniash on the Black Sea; Rhodope, south of the Balkans, and the Taurus and Grammos on the west, continued northward under various names into Bosnia and Herzegovina.

The most important river basin is that which drains into the archipelago of the Ægean Sea, which receives the Vardar, the Struma, the Mista or Karasu, and the Maritsa. The Adriatic and Ionian Seas receive from Turkey no rivers worthy of notice, and the Sea of Marmora receives only a few mountain torrents. The chief lakes are those of Skutari, Ohrida, Janina, Prespa, and Takhyno.

There are several places remarkable for their fertility and beauty. The climate is Mediterranean, with subtropical rains and summer droughts. Temperature is very variable, and owing to the bitter north-east wind is colder than that of Italy or Spain, which are in the same latitude.

**Cities.**—Chief towns are Constantinople, Salonica, and Adrianople.

**Turkey in Asia** comprises the peninsula of Asia Minor, the country intersected by the Euphrates and the Tigris, the mountainous region of Armenia between their upper courses and the Black Sea, the ancient lands of Syria and Palestine, and the coast strips of Arabia along the Red Sea and Persian gulf.

Omitting Arabia, the country consists mainly of (1) a high plateau traversed by the mountain of Taurus and Anti-Taurus, and stretching from the archipelago to the borders of Persia; (2) a plateau of less elevation and extent (Syria and Palestine) traversed by the double range of Lebanon; and (3) the peninsular strip of Mesopotamia on the Lower Tigris and Euphrates.

**Palestine** includes the sanjak (or province) of Jerusalem—to which was added in 1906 the sanjak of Haussa, and the vilayet of Beirut, and part of the vilayet of Syria. The number of Jewish colonies originally founded by Baron E. de Rothschild, but handed over in 1900 to the Jewish Colonization Association, are now about 100. There are also German colonies. The cultivation of the orange is increasing largely. The population of Jerusalem is approximately 80,000, of Jaffa 40,000, of Gaza 35,000, and of Nazareth 20,000. The population of the province is increasing.

The chief towns in Asiatic Turkey are Smyrna, Damascus, Bagdad, Aleppo, and Beirut.

**People.**—In European provinces under immediate Turkish rule, Turks, Albanians, and Greeks nearly equal in numbers, are 70 per cent. of the population; Bulgarians, Roumans, Armenians, Magyars, gypsies, Jews, and Circassians. In Asiatic Turkey the Turks come first, with four-fifths of the population; Bulgarians, Syrians, Kurds, Circassians, Armenians, and Jews.

**United States of America,** the most important republic of the world, embraces nearly one-half of the habitable area of the North American continent, and about seven-eighths of its inhabitants.

Its area is more than three-fourths that of all Europe; including Alaska, it is almost equal to it; but its population is less than half that of Europe. It occupies the central part of the continent from the Atlantic to the Pacific Ocean, and from Canada on the north to Mexico on the south. Its greatest length east to west is about 2,700 miles, and its greatest width, north to south, about 1,600 miles. Besides Alaska, there are fifty political divisions. Of these, forty-six are states enjoying the full privileges accorded by the federal constitution, and five territories, all are organized but not yet admitted to statehood. The Philippines have a modified territorial government.

The following particulars give numerous important facts concerning the states and territories:

## STATES AND TERRITORIES OF THE UNION—

STATE OR TERRITORY AND AREA 1911	ORIGIN AND MEANING OF NAME	DATE OF ADMISSION INTO UNION	SETTLEMENT	ORIGINAL TERRITORY FROM WHICH DERIVED	POPULA- TION WHEN ADMITTED OR ACQUIRED	MILES OF RAIL- ROAD 1910	PER- CENT TO SQ. MILE 1910
			Where, When, By Whom				
<b>Alabama</b> 51,998 sq. miles.	Indian—Here we rest.	1819	Mobile Bay, 1702, by the French.	Louisiana, Georgia and Mississippi and Alabama territories.	127,901	5,165.24	41.1
<b>Alaska</b> 590,884 sq. miles.	Al- <i>as</i> - <i>ka</i> , meaning "the great country."	1867	Three Saints, 1784, by the Russians.			302.92	0.1
<b>Arizona</b> 112,956 sq. miles.	Indian—meaning "sand hills."	1911	Tucson, 1580, by the Spaniards.	New Mexico territory.	205,000	1,994.36	1.8
<b>Arkansas</b> 53,335 sq. miles.	From a tribe of Indians.	1836	Arkansas Post, 1683, by the French.	Louisiana and Louisiana, Missouri and Arkansas territories.	97,574	5,236.52	30.0
<b>California</b> 156,297 sq. miles.	From an old Spanish romance.	1850	San Diego, 1768, by the Spaniards.	New Albion, Upper California.	92,567	7,528.86	15.2
<b>Colorado</b> 103,948 sq. miles.	Spanish—Red, or Ruddy.	1876	Aurora, 1859, by the Americans.	Louisiana and Mexican cession. Colorado territory.	175,000	5,454.43	7.7
<b>Connecticut</b> 4,965 sq. miles.	Indian—Long River.	*1788	Windsor, 1636, by the English.	North Virginia, New England.	237,664	1,004.74	231.3
<b>Delaware</b> 2,370 sq. miles.	In honor of Lord De La Warr.	*1787	Wilmington, 1637, by the Swedes.	New Sweden, New Netherlands, three lower counties on the Delaware.	59,096	336.64	103.0
<b>District of Col.</b> 70 sq. miles.	In honor of Columbus.	1791	Rome, 1663, by the English.	Ceded to government by Maryland and Virginia.		35.27	5,517.8
<b>Florida</b> 58,666 sq. miles.	Spanish—Blooming	1845	St. Augustine, 1565, by the Spaniards.	Florida territory.	87,445	4,254.05	13.7
<b>Georgia</b> 59,265 sq. miles.	In honor of George II.	*1788	Savannah, 1733, by the English.	One of the original thirteen states.	82,546	6,939.59	44.4
<b>Hawaii</b> 6,440 sq. miles.	From the native Owhyhee.		Honolulu, 1820, by the Americans.	Sandwich islands.	154,001	149.34	3.0
<b>Idaho</b> 84,313 sq. miles.	Indian—Gem of the Mountains.	1890	Coeur d'Alene, 1842, by the Americans.	Oregon, Washington, and Idaho territories.	84,385	2,134.30	3.9
<b>Illinois</b> 56,665 sq. miles.	Indian—The Men.	1818	Kaskaskia, 1682, by the French.	Northwest, Indian and Illinois territories.	55,211	11,850.91	100.7
<b>Indiana</b> 36,354 sq. miles.	Indian's Ground.	1816	Vincennes, 1702, by the French.	Northwest and Indiana territories.	147,178	7,382.55	75.3
<b>Iowa</b> 56,147 sq. miles.	Indian—Drowsy Ones.	1846	Dubuque, 1833, by the Americans.	Louisiana, Missouri, Michigan, Wisconsin, and Iowa territories.	182,000	9,751.94	40.0
<b>Kansas</b> 82,158 sq. miles.	Indian—Smoky Water.	1861	Leavenworth, 1854, by the Americans.	Louisiana, Kansas territory.	107,206	8,952.59	20.7
<b>Kentucky</b> 40,509 sq. miles.	Indian—Dark and Bloody Ground.	1792	Bonesboro, 1769, by the English.	Virginia.	73,677	3,467.43	57.0
<b>Louisiana</b> 48,506 sq. miles.	In honor of Louis XIV.	1812	New Orleans, 1718, by the French.	Louisiana, Territory of Orleans.	76,556	5,456.26	36.6
<b>Maine</b> 33,040 sq. miles.	The Main Land.	1820	Saco, 1623, by the English.	New England, Laconia, and Massachusetts.	298,335	2,165.66	24.8
<b>Maryland</b> 12,327 sq. miles.	In honor of Queen Henriette Maria.	*1788	St. Mary's, 1632, by the English.	One of the original states.	319,728	1,445.21	130.3
<b>Massachusetts</b> 8,266 sq. miles.	The Place of Great Hills.	*1788	Plymouth, 1620, by the English.	North Virginia, New England, Massachusetts Bay.	378,787	2,116.10	418.8
<b>Michigan</b> 37,980 sq. miles.	Indian—Great Lake.	1837	Sault Ste. Marie, 1668, by the French.	Northwest, Indiana, and Michigan territories.	212,267	9,058.83	48.9
<b>Minnesota</b> 84,052 sq. miles.	Indian—Cloudy Water.	1858	St. Paul, 1838, by the Americans.	Louisiana and Northwest and Minnesota territories.	172,793	8,568.30	25.7
<b>Mississippi</b> 46,860 sq. miles.	Indian—Great River, or Father of Waters.	1817	Biloxi, 1699, by the French.	Louisiana and Georgia, Mississippi territory.	75,448	4,397.64	38.8
<b>Missouri</b> 69,420 sq. miles.	Indian—Great Muddy.	1821	St. Genevieve, 1755, by the French.	Louisiana and Louisiana and Missouri territories.	66,586	8,045.47	47.9
<b>Montana</b> 145,572 sq. miles.	Spanish—A Mountain.	1889	Yellowstone River, 1809, by the Americans.	Louisiana and Nebraska, Idaho, Dakota and Montana territories.	175,000	4,135.10	2.6
<b>Nebraska</b> 77,520 sq. miles.	Indian—Shallow Water.	1867	Bellevue, 1847, by the Americans.	Nebraska territory.	122,993	6,015.02	15.5
<b>Nevada</b> 110,690 sq. miles.	Spanish—Snow-covered.	1864	Genoa, 1850, by the Americans.	Upper California and Utah and Nevada Territories.	35,000	2,135.23	0.7
<b>New Hampshire</b> 9,341 sq. miles.	Hampshire, England.	*1788	Portsmouth, 1623, by the English.	North Virginia, New England, Laconia.	141,585	1,248.86	47.7
<b>New Jersey</b> 8,224 sq. miles.	In honor of governor of Jersey Island.	*1787	Elizabethtown, 1617, by the Dutch.	New Netherlands.	184,139	2,255.79	337.7
<b>New Mexico</b> 122,634 sq. miles.		1911			330,000	3,003.96	2.7
<b>New York</b> 49,204 sq. miles.	In honor of Duke of York.	*1788	New York, 1614, by the Dutch.	New Netherlands.	340,120	5,448.15	191.2
<b>North Carolina</b> 52,426 sq. miles.	In honor of Charles II.	*1789	Albemarle Sound, 1633, by the English.	Albemarle colony.	393,751	4,860.24	45.3
<b>North Dakota</b> 70,837 sq. miles.	Indian—Allied.	1889	Pembina, 1859, by the Americans.	Louisiana, Minnesota and Nebraska and Dakota territories.	182,000	4,200.30	8.2

\*Original Thirteen States.

†Organized Territories.

## HISTORICAL, GEOGRAPHICAL AND INDUSTRIAL

CHIEF PRODUCTIONS	HIGHEST AND LOWEST ALTITUDES FEET	PUBLIC LANDS ACRES	MOTTO AND MEANING STATE FLOWER	POPULAR NAME OF STATE AND PEOPLE
Corn, oats, wheat, rice, cotton, sugar, iron, lumber, manufactures, potatoes.	Checha Mt. 2,407 Venetia 7	108,210	<i>Here we rest.</i> Golden-rod.	Ala. "Lizards."
Salmon, gold, copper, silver, lumber, tin, lead, coal.	Mt. McKinley 20,464 Uman Islet 150	368,014,735	<i>No motto.</i>	Alaska.
Copper, gold, silver, alfalfa, fruits, live stock, wheat, barley.	San Francisco Mt. 12,794 Yuma 142	41,491,369	<i>Distans (Founded by God).</i> Sesquiu aetna.	Arizona.
Cotton, lumber, corn, oats, wheat, fruits, wool, coal, tobacco.	Magazine Mt. 2,800 Camden 71	512,705	<i>Regna populi (The people rule).</i> Apple blossom.	Ark. Bear; "Toothpick."
Gold, silver, copper, lead, petroleum, borax, lumber, fruits, wine, olives, beet sugar.	Mt. Whitney 14,502 Death Valley -276	24,564,884	<i>Eureka (I have found it).</i> California poppy.	Cal. Golden; "Gold Hunters."
Gold, silver, coal, copper, vegetables, fruits, live stock, wheat, beet sugar, oats, corn.	Mt. Elbert 14,436 Holmesville 3,291	21,726,192	<i>Nil sine numine (Nothing without providence).</i> Columbine.	Colo. Centennial; "Hovers."
Manufactures, woolen, cotton, notions; tobacco, iron, granite, cereals.	Bear Mountain 2,365 New Haven 6	.....	<i>Qui transiit sustinet (He who transplanted still sustains).</i> Mountain laurel.	Conn. Land of Steady Habits; Nutmeg; "Wooden Nutmegs."
Corn, wheat, tomatoes, fruits, manufactures, leather, iron, steel, machinery.	Brandy wine Delaware City 44	.....	<i>Liberty and Independence.</i> Peach blossom.	Del. Blue Hen; Diamond; "Blue Hen."
Flour mills, manufactures.	Ft. Reno Navy Yard 421	.....	<i>Justitia omnibus (Justice to all).</i>	District of Col.
Fruits, vegetables, tobacco, rice, cotton, lumber, turpentine, resin, fish, phosphate.	Mt. Pleasant Cleveland 301	453,000	<i>In God is our trust.</i> Orange blossom.	Fla. Flower; "Fly-up-the-Creeps."
Cotton, corn, rice, oats, tobacco, oysters, peaches, melons, marble, clay; cotton goods, lumber, fertilizers, tar.	Braetown Bald. 4,768 Brunswick 14	.....	<i>Observe: Wisdom, justice, moderation. Reverse: Agriculture and commerce.</i> Cherokee rose.	Ga. Empire State of the South; "Buzards;" "Crackers."
Sugar, fruits, rice, coffee, hides, wool, honey, sisal.	Mt. Meuna Kea 13,805	.....	.....	Hawaii.
Gold, silver, copper, lead, lumber, flour, wheat, oats, barley, live stock.	Hyndman Peak 12,078 Lewiston 738	24,743,804	<i>Salve (Hall).</i> Syringa.	Idaho.
Corn, wheat, oats, potatoes, hay, live stock, wool, meat, manufactures.	Charles Mount Brooklyn 284	.....	<i>National union, state sovereignty.</i> Violet.	Ill. Prairie; "Buckars;" "Bliss."
Corn, wheat, tobacco, vegetables, fruits, wool, coal, clay, flour, machinery.	Carle Evanaville 1,208 318	.....	<i>No motto.</i> Corn.	Ind. Hoosier; "Hoosiers."
Corn, wheat, oats, potatoes, hay, live stock, butter, coal, lumber, poultry.	Waneta Primquam 1,800 477	.....	<i>Our liberties we prize and our rights we will maintain.</i> Wild rose.	Iowa. Hawkeye; "Hawkeyes."
Corn, wheat, hay, live stock, fruits, coal, petroleum, salt, meats, kaffir corn.	West Boundary Kings 4,135 730	137,180	<i>Ad astra per aspera (To the stars through difficulties).</i> Sunflower.	Kan. Sunflower; "Jayhawkers."
Tobacco, hemp, wheat, cotton, live stock, lumber, coal, sorghum, flour.	Big Black Mt. Columbus 4,100 270	.....	<i>United we stand, divided we fall.</i> Golden-rod.	Ky. Blue Grass; Dark and Bloody Ground; "Cottontailers."
Cotton, corn, rice, sugar, lumber, oysters, salt, sulphur.	New Arcadia Port Hickory -8	58,911	<i>Union, justice, and confidence.</i> Magnolia.	La. Creole; Pelican; "Creoles."
Hay, grains, dairying, potatoes, wool, granite, ice, lumber, apples, paper.	Mt. Katahdin Eastport 5,268 5	.....	<i>Dirigo (I direct).</i> Pine cone.	Maine. Pine Tree; Lumber; "Foxes."
Wheat, hay, corn, vegetables, fruits, oysters, coal, canned fruits, vegetables.	Gt. Backbone Mt. Annapolis 3,400 2	.....	<i>Patti machi, parole femine (Manly deeds, womanly words).</i> Golden-rod.	Md. Old Line; "Crattumpers."
Manufactures (woolen, cotton), boots, shoes, fish, tobacco, granite, marble.	Greylock Boston 3,505 -5	.....	<i>Ense petit placidam sub libertate quietem (With the sword she seeks calm peace under liberty).</i>	Mass. Bay; "Seacoasters."
Corn, wheat, oats, hay, fruits, vegetables, iron, copper, clay, lumber, manufactures.	Porcupine Mt. Rockwood 2,023 576	107,590	<i>Si quaeris peninsulam amaram, circumspice (If you seek a beautiful peninsula, behold it here).</i> Apple blossom.	Mich. Wolverine; "Wolverines."
Corn, wheat, oats, barley, flaxseed, wool, live stock, flour, iron, lumber, dairying.	Misquah Hills Winona 2,400 606	1,563,302	<i>L'étoile du nord (The star of the north).</i> Moonskin.	Minn. North Star, Gopher; "Gophers."
Cotton, corn, wheat, oats, potatoes, rice, tobacco, oysters, shrimp.	Holy Springs Calhoun 602 4	47,058	<i>No motto.</i> Magnolia.	Miss. Bayou; "Tadpoles."
Corn, wheat, oats, rye, cotton, swine, honey, sisal, lead, tobacco, meats.	Cedar Gap Maywood 1,900 140	2,510	<i>Salus populi suprema lex esto (The welfare of the people is the supreme law).</i> Golden-rod.	Mo. "Pukes."
Wheat, wool, live stock, fruit, oats, barley, lumber, copper, lead, silver, coal.	Granite Peak Yakt 12,831 1,545	36,015,943	<i>Oro y plata (Gold and silver).</i> Bitter root.	Mont. Mountain; "Bug- eaters;" "Stubbies."
Corn, wheat, oats, live stock, hay, chicory, sugar beets, fruits, potatoes.	Lewis Browaville 5,942 875	1,879,486	<i>Equality before the law.</i>	Neb.
Gold, silver, copper, zinc, wool, live stock, lumber, borax.	Wheeler Peak Saratoga Springs 13,058 264	56,474,658	<i>All for our country.</i>	Nev. Silver; "Sage Hens."
Hay, corn, potatoes, oats, apples, granite, mica, manufactures.	Mt. Washington Hampton Falls 6,290 9	.....	<i>No motto.</i>	N. H. Granite; "Granite Boys."
Market garden crops, cereals, fruits, fisheries, manufactures, textiles, machinery.	High Point Crystal Lake 1,799 2	.....	<i>No motto.</i>	N. J. Jersey Blue; "Jersey Blues;" "Clam- catchers."
Gold, silver, fruits, vegetables, live stock, wool, lumber, copper, coal, turquoise.	Trushan Peak Leadville Peak 13,306 2,661	36,454,682	<i>Crescit eundo (It increases by going).</i>	N. Mex.
Market garden crops, fruits, corn, wheat, dairying, manufactures, clothing, textiles, books, magazines, paper.	Mt. Marcy Albany 5,344 25	.....	<i>Excelsior (Higher).</i>	N. Y. Empire; "Knickerbockers."
Cotton, corn, tobacco, wheat, shad, oysters, lumber, mining.	Mt. Mitchell Edenton Bay Summit 6,711 2,560	.....	<i>Esse quam videri. (To be, rather than to seem).</i> Rose.	N. C. Old North; Tur- pentine; "Tar heels."
Wheat, oats, barley, flaxseed, live stock, wool, minerals.	Buressmont 800	1,410,225	<i>Liberty and union, now and forever, one and inseparable.</i> Wild rose.	N. D. Sioux; "Tuckers."

## STATES AND TERRITORIES OF THE UNION—

STATE OR TERRITORY AND AREA 1911	ORIGIN AND MEANING OF NAME	DATE OF ADMISSION TO UNION	SETTLEMENT		ORIGINAL TERRITORY FROM WHICH DERIVED	POPULA- TION WHEN ADMITTED OR ACQUIRED	MILES OF RAIL- ROAD 1910	PAS- SAGE TO SEA MILE 1910
			Where, When, By Whom					
<b>Ohio</b> 41,040 sq. miles.	Indian—Beautiful River.	1803	Marietta, 1788, by the Americans.		Northwest territory.	45,365	9,079.19	117.0
<b>Oklahoma.</b> 70,057 sq. miles.	Indian—Beautiful Land.	1907	Outhrie, 1900, by the Americans.		Indian and Oklahoma territories.	1,414,042	5,785.06	23.9
<b>Oregon</b> 96,099 sq. miles.	Spanish—Wild Marjoram.	1859	Astoria, 1811, by the Americans.		Oregon territory.	52,566	2,159.55	7.0
<b>Pennsylvania</b> 45,126 sq. miles.	Latin—Penn's Woods.	*1787	Chester, 1638, by the Swedes.		Original state.	434,373	11,205.89	171.0
<b>Philippines</b> 115,026 sq. miles.	In honor of Philip II.	.....	Cebu, 1565, by the Span- ish.		Archipelago de San Laazaro.	7,000,000	.....	66.0
<b>Rhode</b> 3,435 sq. miles.	Spanish—Rich Port.	.....	San Juan, 1510, by the Span- ish.		.....	952,243	.....	.....
<b>Rhode Island</b> 1,245 sq. miles.	Rhodes, an island in the Aegean Sea.	*1790	Providence, 1636, by the English.		Providence and Rhode Island planta- tions.	68,825	212.54	508.5
<b>South Carolina</b> 30,569 sq. miles.	In honor of Charles II.	*1788	Ashley River, 1670, by the English.		Carteret colony.	249,073	3,397.37	49.7
<b>South Dakota</b> 17,615 sq. miles.	Indian—Allied.	1889	Southwest part, 1850, by the Americans.		Louisiana, Minnesota, and Nebraska and Dakota territories.	328,808	2,947.65	7.6
<b>Tennessee</b> 42,022 sq. miles.	Indian—River with the Great Bend.	1790	Fort Loudon, 1757, by the English.		North Carolina, territory south of the Ohio river.	35,791	3,761.03	82.4
<b>Texas</b> 305,896 sq. miles.	From tribe of Indians.	1845	San Antonio, 1692, by the Spanish.		.....	212,592	13,520.64	14.8
<b>Utah</b> 84,960 sq. miles.	Indian—Mountain Dwellers.	1896	Salt Lake City, 1847, by the Americans.		Mexican cession, Utah territory.	207,905	1,956.84	4.5
<b>Vermont</b> 9,554 sq. miles.	French—Green Mountain.	1791	Fort Dummer, 1724, by the English.		New Netherland, New Hampshire grants.	85,425	1,088.27	39.0
<b>Virginia</b> 42,627 sq. miles.	In honor of Elizabeth, the virgin queen.	*1788	Jamestown, 1607, by the English.		South Virginia.	748,308	4,486.64	51.2
<b>Washington</b> 59,127 sq. miles.	After George Washington, first President of United States.	1889	Columbia River, 1811, by the English.		Oregon and Washington territories.	349,390	4,650.63	17.1
<b>West Virginia</b> 24,170 sq. miles.	From Virginia.	1863	Berkeley County, 17607, by the Americans.		Virginia.	376,668	3,602.40	50.8
<b>Wisconsin</b> 56,060 sq. miles.	Indian—Wild Rushing	1848	Green Bay 1745, by the French.		Northwest, Illinois, Michigan and Wisconsin territories.	305,391	7,444.83	42.2
<b>Wyoming</b> 97,914 sq. miles.	Indian—Extensive Plain.	1900	Cheyenne, 1667, by the Americans.		Louisiana (chiefly), Nebraska, Dakota, Idaho, and Wyoming terri- tories.	60,705	1,618.41	1.5

\*Original Thirteen States. †Organized Territories.

## POLITICAL AND STATISTICAL

STATE AND POPULATION 1910	CAPITALS AND POPULATION 1910	REQUIREMENTS AS TO CITIZENSHIP	PREVIOUS RESIDENCE REQUIRED				PEOPLE EXCLUDED FROM SUFFRAGE	GOVERNORS	
			In State	In County	In Town	In Pre- cinct		Sal- aries	1/2 Term Yrs.
<b>Alabama</b> Pop. 2,138,093	Montgomery Pop. 38,136	Citizen of United States or alien who has declared intentions.	2 years	1 year	3 mos.	3 mos.	Convicted of treason or other felonies, idiots or insane.	\$5,000	4
<b>Arizona</b> Pop. 204,254	Phoenix Pop. 11,134	Citizen of United States by nativity or naturalization.	1 year	30 days	.....	30 days	Idiot, insane, felon, under guardianship.	3,000	4
<b>Arkansas</b> Pop. 1,574,440	Little Rock Pop. 45,941	Citizen of United States or alien who has declared intentions.	1 year	6 mos.	30 days	30 days	Idiot, insane, convicted of felony, failure to pay poll-tax, U. S. soldiers, or marines.	4,000	2
<b>California</b> Pop. 2,377,540	Sacramento Pop. 44,606	Citizen by nativity, naturalization (90 days prior to election), or treaty of Querefaro.	1 year	90 days	.....	30 days	Chinese, idiots, insane, ambassadors of public missions, convicted of infamous crimes.	10,000	4
<b>Colorado</b> Pop. 799,024	Denver Pop. 213,381	Citizen, native or naturalized (intentions declared), male or female who is duly registered.	1 year	90 days	30 days	10 days	White confined in public prison, under guardianship, non compos mentis, insane.	5,000	2
<b>Connecticut</b> Pop. 1,114,756	Hartford Pop. 98,915	Citizen of United States, who can read English language.	1 year	.....	6 mos.	.....	Convicted of infamous crime, unless pardoned.	4,000	2
<b>Delaware</b> Pop. 202,322	Dover Pop. 3,720	Citizen who shall have paid a registration fee of \$1.00.	1 year	3 mos.	.....	30 days	Insane persons and paupers, person convicted of felony, idiot.	4,000	4
<b>District of Col.</b> Pop. 331,060	Washington Pop. 331,060	District is without suffrage.	.....	.....	.....	.....	District is governed by three commissioners appointed by the President.	6,000	3
<b>Florida</b> Pop. 752,610	Tallahassee Pop. 5,018	Citizen of United States.	1 year	6 mos.	.....	30 days	Idiot, duelist, convicted of felony or any infamous crime.	5,000	4
<b>Georgia</b> Pop. 2,609,121	Atlanta Pop. 154,530	Citizen of United States who can read and has paid all his taxes since 1877.	1 year	6 mos.	.....	.....	Convicted of felony, bribery or larceny, unless pardoned, idiot, and insane, delinquent taxpayer.	5,000	2
<b>Idaho</b> Pop. 325,594	Boise City Pop. 17,358	Citizen of United States, male or female.	6 mos.	30 days	3 mos.	10 days	Idiot, insane, convicted of felony, bigamist, polygamist, under guardianship, Chinese, Indian.	5,000	2
<b>Illinois</b> Pop. 5,638,591	Springfield Pop. 51,678	Citizen of United States.	1 year	90 days	30 days	30 days	Convicted of felony or bribery in election, unless restored to citizenship.	12,000	4
<b>Indiana</b> Pop. 2,700,876	Indianapolis Pop. 233,650	Citizen, or alien who has declared intention and resided one year in United States.	6 mos.	60 days	60 days	30 days	United States soldiers, sailors, and marines, and persons convicted of infamous crime.	8,000	4
<b>Iowa</b> Pop. 2,224,771	Des Moines Pop. 86,368	Citizen of United States.	6 mos.	60 days	10 days	10 days	Idiot, insane, convicted of infamous crime, U. S. soldiers.	6,400	3
<b>Kansas</b> Pop. 1,650,940	Topeka Pop. 43,684	Citizen of United States or alien who has declared intention.	6 mos.	30 days	30 days	10 days	Convicted of treason or felony, insane, under guardianship.	5,000	2
<b>Kentucky</b> Pop. 2,289,905	Frankfort Pop. 10,465	Citizen of United States.	1 year	6 mos.	60 days	60 days	Convicted of treason, felony, or bribery in an election, idiot, and insane.	6,500	4

CHIEF PRODUCTS	HIGHEST AND LOWEST ALTITUDES FEET	PUBLIC LANDS ACRES	MOTTO AND MEANING STATE FLOWER	POPULAR NAMES OF STATES AND PEOPLES
Corn, wheat, oats, hay, potatoes, fruits, tobacco, live stock, wool, dairying, coal, petroleum, salt, iron, steel, machinery, flour.	{ Bellefontaine 1,540 Palestine 437	.....	No motto. Carnation.	Ohio. Buckeye; "Buckeyes."
Corn, wheat, oats, cotton, flax, live stock, petroleum, minerals.	{ West Beaver Co. 5,000 Appalachia 411	5,007	<i>Labor omnia vincit</i> (Labor conquers everything). Mistletoe. <i>Tax union.</i> Oregon grape.	Okla. Sooner.
Lumber, live stock, wheat, hay, fruits, hops, wool, salmon, gold, silver, paper making, Manufactures, steel, machinery, textiles, coal, coke, petroleum, natural gas, iron, grains, wool, leather.	{ Mt. Hood 11,225 North Sands 5 Blue Knob 3,126 Philadelphia 9	17,580,573	<i>Virtue, liberty, and independence.</i>	Ore. Beaver, Sunset; "Webfoot."
Cacao, coffee, tobacco, cotton, hemp, coconuts, corn, sugar, rice, lumber, dyewoods, Coffee, sugar, tobacco, cotton, citrus, fruits, bananas, pineapples, salt.	Mt. Davao 10,312	.....		Pa. Keystone; "Pennamites," "Leather-bones."
Manufactures, worsted, cotton, jewelry, machinery, rubber, minerals.	.....	3,000		{ Philippines Porto Rico.
Cotton, wheat, corn, oats, tobacco, rice, corn, wheat, turpentine, lumber, phosphates.	{ Durfee Hill 805 Newport Depot 6 Rich Mt. 3,569 Fort Royal 1,405	.....	<i>Hope.</i> The violet. <i>Dum spiro, spero.</i> <i>Spee</i> (While I breathe, I hope, I hope).	R. I. Little Rhody; "Gun-finta."
Corn, wheat, oats, flax, potatoes, live stock, wool, gold, silver, tin, dairying.	{ Harney Peak 7,240 Big Stone Lake 952 Mt. Cayote 6,586 Memphis 117	4,562,804	<i>Under God the people rule.</i> <i>Anemone patens.</i> Lupines, commerce.	S. C. Palmetto; "Weavie."
Corn, wheat, cotton, potatoes, tobacco, live stock, coal, iron, marble, lumber.	{ El Capitan 8,690 Galveston 4 Gilbert Peak 13,687 Washington 2,720	35,955,554	No motto. Blue bonnet. <i>Industry.</i> Bego lily.	"Swigs Cate." Texas. Volunteer; "Butternut," "Wheelpa." Texas, Lone Star; "Red-bellied."
Corn, wheat, cotton, potatoes, coal, gold, silver, copper, lead, coal, vegetables, fruits, sugar, wheat, oats, live stock, wool.	.....	2,720		Utah.
Hay, cereals, potatoes, lumber, marble, dairying, maple sugar, manufactures, wool, pulp.	{ Mt. Mansfield 4,406 Lake Champlain 90	.....	<i>Freedom and unity.</i> Red clover.	Vt. Green Mountain; "Green Mountain Boys."
Corn, wheat, oats, tobacco, potatoes, cotton, cysters, coal, iron, cotton manufacture.	{ Rogers Mt. 5,719 Hampton 3	.....	Obverse: <i>Sic semper tyrannis</i> (Ever so to tyrants). Reverse: <i>Perseverando</i> (By perseverance). <i>A-Ki</i> (Bye-bye). Rhododendron.	Va. Old Dominion; "Beagles."
Lumber, coal, wheat, barley, oats, fruits, salmon, live stock, minerals.	{ Mt. Rainier 14,363 Tulalip —4	3,190,059		Wash. Evergreen; "Chinook."
Corn, oats, hay, wheat, fruits, cattle, sheep, lumber, coal, petroleum, natural gas, mining.	{ Spruce Mt. 4,800 Harper's Ferry 277	.....	Obverse: <i>Montani semper liberi</i> (Mountaineers are always free men). Reverse: <i>Libertas et Fides</i> (Liberty and Fidelity).	W. V. Panhandle "Panhandlers."
Corn, oats, barley, wheat, hay, potatoes, fruit, beet sugar, dairying, iron, lumber.	{ Summit Lake 1,940 Michigan Lake 579	14,460	<i>Forward.</i>	Wis. Badger; "Hocheese."
Wool, lumber, coal, copper, petroleum, minerals.	{ Grand Teton 13,790 Old Riverdale 3,196	34,575,159	<i>Equal rights.</i>	Wyoming.

LEGISLATURES			MEMBERS		TOTAL ASSESSED VALUATION	PER CENT ACTUAL VALUE	TAX RATE \$1,000	VOTING POPULATION			COLORED POPULATION 1900	FOREIGN POPULATION 1900	NATIVE POPULATION 1900	NAME OF STATE	
Ann. or Bienn.	Limit of Term	Salaries of Members	Senators	Representatives				Total	Whites	Negroes					
Quasd.	60 days	\$4.00 per diem	4	4	11	\$505,568,616	60	\$6.50	413,862	232,294	181,471	827,307	14,592	1,814,105	Alabama
Bien.	60 days	\$4.00 per diem	2	2	0	93,562,749	60	7.00	44,081	34,911	1,084	1,848	24,233	98,698	Arizona
Bien.	60 days	\$5.00 per diem	4	2	9	327,023,552	40	6.75	313,836	226,597	87,157	266,856	14,289	1,297,276	Arkansas
Bien.	60 days	\$7.00 per term	4	2	10	2,373,897,092	50-60	3.53	544,067	469,545	3,711	11,045	267,240	1,117,813	California
Bien.	90 days	\$1.000 per term	4	2	5	.....	.....	.....	185,708	181,616	3,218	8,570	91,185	448,545	Colorado
Bien.	None	\$300 per annum	2	2	7	922,071,592	100	.....	280,340	275,126	4,576	15,226	238,210	670,210	Connecticut
Bien.	60 days	\$5.00 per diem	4	2	3	86,306,094	60	.....	54,018	45,592	8,374	30,697	13,810	170,925	Delaware
United States act	State legislature.	.....	.....	.....	.....	323,909,530	67	15.00	83,823	60,318	23,072	86,702	20,119	.....	Dist. of Col.
Bien.	60 days	\$6.00 per diem	4	2	5	136,032,089	50	7.50	139,661	77,962	61,417	230,730	23,832	504,710	Florida
Ann.	50 days	\$4.00 per diem	2	2	13	604,338,208	.....	5.00	500,752	277,496	223,073	1,034,813	12,403	2,303,928	Georgia
Bien.	60 days	\$5.00 per diem	2	2	3	.....	20	.....	53,932	50,328	130	293	24,604	137,168	Idaho
Bien.	None	\$1,000 per annum	4	2	27	2,158,648,450	33	3.50	1,401,456	1,370,209	29,762	85,078	966,747	3,854,803	Illinois
Bien.	60 days	\$6.00 per diem	4	2	15	1,776,132,096	60	3.38	720,206	701,761	18,166	57,505	142,121	2,374,341	Indiana
Bien.	None	\$550 to \$1,250 per term	4	2	13	624,391,061	25	3.30	635,298	630,665	4,441	12,693	305,920	1,923,933	Iowa
Bien.	50 days	\$3.00 per diem	4	2	10	2,752,097,452	100	12.50	413,768	398,552	14,065	62,006	126,685	1,343,810	Kansas
Bien.	60 days	\$5.00 per diem	4	2	13	823,275,022	65	5.00	543,996	469,205	74,728	284,706	50,249	2,096,925	Kentucky

## POLITICAL AND STATISTICAL FACTS

STATES AND POPULATION 1910	CAPITALS AND POPULATION 1910	REQUIREMENTS AS TO CITIZENSHIP	PREVIOUS RESIDENCE REQUIREMENTS				PERSONS EXCLUDED FROM SUFFRAGE	GOVERNORS	
			In State	In County	In Town	In Precinct		Salaries	Length Term Yrs.
<b>Louisiana</b> Pop. 1,656,388	Baton Rouge Pop. 14,897	Citizen of United States.	2 years	1 year	.....	6 mos.	Idiot, insane, felons under indictment, inmates of prison or charitable institution except soldier's home. Paupers and Indians not taxed.	\$5,000	4
<b>Maine</b> Pop. 742,371	Augusta Pop. 12,211	Citizen of United States.	3 mos.	3 mos.	3 mos.	3 mos.	Felons not pardoned, lunatics, non compos mentis, bribery.	3,000	2
<b>Maryland</b> Pop. 1,295,346	Baltimore Pop. 8,609	Citizen of United States who can read English.	1 year	6 mos.	6 mos.	1 day	Paupers (except U. S. soldiers) and persons under guardianship.	4,500	4
<b>Massachusetts</b> Pop. 3,566,416	Boston Pop. 670,585	Citizens who can read and write English.	1 year	6 mos.	6 mos.	6 mos.	Idians with tribal relations, duellists, and accessories.	5,000	1
<b>Michigan</b> Pop. 2,810,173	Lansing Pop. 31,229	Citizen of United States or alien who declared intention 2 years and 6 months prior to November 8, 1894.	6 mos.	20 days	20 days	20 days		3,000	2
<b>Minnesota</b> Pop. 2,078,706	St. Paul Pop. 214,744	Citizen of United States who has been such for 3 months preceding election.	6 mos.	30 days	30 days	30 days	Convicted of treason or felony, unpardoned, under guardianship, insane, Indians lacking customs of civilization.	7,500	2
<b>Mississippi</b> Pop. 1,797,114	Jackson Pop. 21,263	Citizen of United States who can read or understand constitution.	2 years	1 year	1 year	1 year.	Idians, idiot, Indians not taxed, felons, persons who have not paid taxes, bigamists.	4,500	4
<b>Missouri</b> Pop. 3,293,335	Jefferson City Pop. 11,850	Citizen of United States or alien who has declared intention not less than 1 year nor more than 6 before election.	1 year	60 days	60 days	30 days	Persons in poorhouse or asylum at public expense, those in prison, or convicted of infamous crime.	8,000	4
<b>Montana</b> Pop. 375,053	Helena Pop. 12,818	Citizen of United States.	1 year	30 days	30 days	30 days	Felons not pardoned, idiot, insane, U. S. soldiers, seamen, and marines.	5,000	4
<b>Nebraska</b> Pop. 1,102,214	Lincoln Pop. 45,973	Citizen of United States or alien who has declared intention 30 days before election.	6 mos.	40 days	30 days	10 days	Convicted of treason or felony, unless restored to civil rights.	2,500	2
<b>Nevada</b> Pop. 81,875	Carson City Pop. 2,466	Citizen of United States.	6 mos.	30 days	30 days	30 days	Idiot, insane, unpardoned convicts, Indians, Chinese.	4,000	4
<b>New Hampshire</b> Pop. 430,573	Concord Pop. 21,497	Citizen of United States.	6 mos.	6 mos.	6 mos.	6 mos.	Paupers (except soldiers).	3,000	2
<b>New Jersey</b> Pop. 2,537,107	Trenton Pop. 96,815	Citizen of United States.	1 year.	5 mos.	.....	.....	Idiot, paupers, insane, convicted of crime, unless pardoned or restored by law.	10,000	3
<b>New Mexico</b> Pop. 327,301	Santa Fe Pop. 8,072	Citizen of United States.	6 mos.	3 mos.	30 days	30 days	Convicted of felony, unless pardoned, U. S. soldier, sailor, or camp follower, Indian.	3,000	2
<b>New York</b> Pop. 9,113,614	Albany Pop. 100,283	Citizen who shall have been a citizen for ninety days prior to election.	1 year	4 mos.	30 days	30 days	Offenders against elective franchise habits, guilty of bribery, betting on elections, and persons convicted of bribery or infamous crime and not restored to citizenship by the Executive.	10,000	2
<b>North Carolina</b> Pop. 2,306,287	Raleigh Pop. 19,218	Citizen of United States who can read.	2 years	6 mos.	.....	4 mos.	Convicted of felony; or infamous crime; or idiot, Indian.	4,000	4
<b>North Dakota</b> Pop. 877,056	Bismarck Pop. 8,443	Citizen of United States and civilized Indian.	1 year	6 mos.	.....	0 day	Under guardianship, persons non compos mentis, or convicted of felony and treason, unless restored to civil rights.	5,000	2
<b>Ohio</b> Pop. 4,767,121	Columbus Pop. 181,548	Citizen of United States.	1 year	30 days	20 days	20 days	Idiot, insane and felons, persons in U. S. military and naval service on duty in Ohio.	10,000	2
<b>Oklahoma</b> Pop. 1,687,158	Oklahoma City Pop. 64,205	Citizen of United States and Native Indians.	6 mos.	60 days	60 days	30 days	Felons, idiot, insane.	4,500	4
<b>Oregon</b> Pop. 672,765	Salem Pop. 14,094	Citizen of United States or alien who has declared intention more than 1 year prior to election.	6 mos.	None	None	None	Idiot, insane, convicted of felony, Chinese, U. S. soldiers and sailors.	5,000	4
<b>Pennsylvania</b> Pop. 7,666,111	Harrisburg Pop. 64,186	Citizen of United States at least 1 year and if 22 years old or more must have paid tax within 2 years.	1 year	.....	.....	2 mos.	Convicted of perjury and fraud as election officers, or bribery of voters, taxpayters.	10,000	4
<b>Rhode Island</b> Pop. 542,610	Providence Pop. 224,326	Citizen of United States.	2 years	.....	6 mos.	.....	Paupers, lunatics, felons.	3,000	1
<b>South Carolina</b> Pop. 1,515,400	Columbia Pop. 26,319	Citizen of United States.	2 years	1 year	4 mos.	4 mos.	Felons, bribery, unless pardoned, insane, paupers.	3,500	2
<b>South Dakota</b> Pop. 583,888	Pierre Pop. 3,656	Citizen of United States or alien who has declared intention, Indian who has severed tribal relations.	6 mos.	30 days	10 days	10 days	Under guardianship, insane, convicted of treason or felony unless pardoned, U. S. soldiers, seamen, and marines.	3,000	2
<b>Tennessee</b> Pop. 2,184,789	Nashville Pop. 110,364	Citizen of United States who has paid poll-tax of preceding year.	1 year	6 mos.	.....	.....	Convicted of bribery or other infamous crime.	7,500	2
<b>Texas</b> Pop. 3,896,542	Austin Pop. 29,860	Citizen of United States or alien who has declared intention 6 months prior to election.	1 year	6 mos.	6 mos.	.....	Idiot, lunatic, pauper, convicted of felony, United States soldiers, marines, and seamen.	4,000	2
<b>Utah</b> Pop. 373,331	Salt Lake City Pop. 92,777	Citizen of United States, male or female.	1 year	4 mos.	.....	60 days	Idiot, insane, convicted of treason or crime against elective franchise, unless pardoned.	4,000	4
<b>Vermont</b> Pop. 355,956	Montpelier Pop. 7,856	Citizen of United States.	1 year	3 mos.	3 mos.	3 mos.	Those who have not obtained the approbation of the local board of civil authority.	2,500	2
<b>Virginia</b> Pop. 2,061,612	Richmond Pop. 127,628	All persons who have paid state poll-tax for the three preceding years; who served in time of war in the army or navy of the United States, of the Confederate states, or of any state.	2 years	1 year	1 year	30 days	Idiot, lunatics, paupers, felons.	5,000	4
<b>Washington</b> Pop. 1,141,090	Olympia Pop. 8,906	Citizen of United States and all residents of territory prior to statehood.	1 year	90 days	30 days	30 days	Idiot, lunatic, convicted of infamous crimes, Indians not taxed.	6,000	4
<b>West Virginia</b> Pop. 1,321,119	Charleston Pop. 22,996	Citizen of the state.	1 year	6 mos.	60 days	.....	Paupers, idiot, lunatics, convicted of treason, felony, or bribery at elections, U. S. soldiers and sailors.	5,000	4
<b>Wisconsin</b> Pop. 2,333,860	Madison Pop. 25,531	Citizen of United States or alien who has declared intention, and civilized Indians.	1 year	10 days	10 days	10 days	Under guardianship, insane, convicted of crime or treason, betting on elections.	5,000	2
<b>Wyoming</b> Pop. 146,965	Cheyenne Pop. 11,320	Citizen of United States, male or female.	1 year	60 days	10 days	10 days	Idiot, insane, felons, unable to read state constitution in the English language.	4,000	4

## CONCERNING THE STATES—Continued

LEGISLATURES			MEMBERS			TOTAL ADMITTED VALUATION	PER CENT ACTUAL VALUATION	TAX RATE PER \$1,000	VOTING POPULATION			COLORED POPULA- TION 1900	FOREIGN POPULA- TION 1900	NATIVE POPULA- TION 1900	STATES
Ann. or Blen.	Length of Term	Salaries of Members	Senators	Representatives	Electoral Votes, 1900				Total	Whites	Negroes				
Blen.	60 days	\$3.00 per diem	4	4	9	\$829,419,463	...	\$5.00	323,843	177,878	147,348	650,804	82,903	1,328,722	Louisiana
Blen.	None	\$300 per annum	2	2	6	428,212,465	100	2.08	217,663	216,856	445	1,319	93,330	601,136	Maine
Blen.	90 days	\$5.00 per diem	4	2	8	820,831,339	..	1.60	231,903	200,979	60,406	235,064	93,934	1,094,110	Maryland
Ann.	None	\$750 per annum	4	1	16	4,770,558,822	..	.....	843,465	830,049	10,456	31,074	846,324	1,950,022	Massachusetts
Blen.	None	\$800 per annum	1	2	14	1,687,155,697	80	2.72	603,478	712,245	5,193	15,816	541,663	1,879,329	Michigan
Blen.	90 days	\$500 per annum	4	2	11	1,222,430,377	36	2.70	506,794	802,384	2,168	4,959	508,318	1,246,076	Minnesota
Blen.	None	\$400 per session	4	4	10	393,297,175	50-75	6.00	349,177	150,530	197,996	907,630	7,981	1,543,289	Mississippi
Blen.	70 days	\$5.00 per diem	4	2	18	1,047,126,736	50	1.70	856,684	809,797	46,413	161,234	216,739	2,890,286	Missouri
Blen.	60 days	\$10.00 per diem	4	2	3	369,673,699	50	2.80	101,931	94,873	711	1,523	67,067	176,262	Montana
Blen.	60 days	\$5.00 per diem	2	2	6	412,138,607	20	5.00	301,091	297,817	2,298	6,269	177,347	888,953	Nebraska
Blen.	90 days	\$8.00 per diem	4	2	3	73,856,142	.....	.....	17,710	14,552	70	134	10,093	32,242	Nevada
Blen.	None	\$200 per annum	2	2	4	255,095,571	75	30.58	130,987	130,548	230	662	88,107	323,481	N. Hampshire
Ann.	None	\$500 per annum	3	1	12	.....	.....	.....	555,005	632,750	21,474	60,844	431,884	1,451,785	New Jersey
Blen.	60 days	\$4.00 per diem	2	2	..	62,860,852	20	11.00	55,067	50,804	775	1,610	13,525	181,885	New Mexico
Ann.	None	\$1,500 per annum	2	1	39	9,821,620,552	80	None	2,184,965	2,145,067	31,425	99,232	1,900,425	3,368,460	New York
Blen.	60 days	\$4.00 per diem	2	2	12	565,095,223	60	2.50	417,875	289,263	127,114	624,460	4,492	1,889,318	North Carolina
Blen.	60 days	\$5.00 per diem	4	2	4	278,594,193	20	4.40	95,217	93,237	115	286	113,091	206,055	North Dakota
Blen.	None	\$1,000 per annum	2	2	23	2,352,680,824	60	1.35	1,212,223	1,180,599	31,235	96,001	458,734	3,698,811	Ohio
Blen.	60 days	\$6.00 per diem	4	2	7	850,600,000	100	2.50	1,414,042	.....	.....	14,831	15,680	769,852	Oklahoma
Blen.	40 days	\$1.00 per diem	2	1	4	598,133,063	.....	.....	144,446	131,261	860	1,105	65,748	347,788	Oregon
Blen.	None	\$1,500 per annum	4	2	34	5,769,777,327	.....	.....	1,817,239	1,763,482	31,668	156,845	985,250	5,316,863	Pennsylvania
Ann.	60 days	\$5.00 per diem	1	1	4	511,990,122	.....	1.80	1271,44	124,001	2,765	9,092	134,519	294,037	Rhode Island
Ann.	40 days	\$200 per annum	2	2	9	271,100,302	40	6.75	283,325	130,375	152,860	782,321	5,528	1,331,788	South Carolina
Blen.	60 days	\$5.00 per diem	2	2	4	321,670,665	20	4.00	112,681	107,353	184	465	88,506	213,062	South Dakota
Blen.	75 days	\$5.00 per diem	2	2	12	156,639,736	.....	8.50	487,380	375,046	112,236	460,243	17,746	2,002,570	Tennessee
Blen.	None	\$3.00 per diem	4	2	19	2,309,803,626	.....	40	737,768	599,961	126,875	620,722	179,357	2,869,253	Texas
Blen.	60 days	\$1.00 per diem	4	2	3	146,204,050	60	5.00	67,172	65,205	358	672	53,777	222,972	Utah
Blen.	None	\$1.00 per diem	2	2	4	188,493,516	.....	.....	108,356	108,027	289	826	44,747	298,894	Vermont
Blen.	90 days	\$500 per session	4	2	12	579,565,539	.....	3.50	447,815	301,379	146,122	660,722	19,461	1,534,723	Virginia
Blen.	60 days	\$5.00 per diem	4	2	8	789,912,979	39	31.00	195,572	183,999	1,230	2,511	111,364	406,739	Washington
Blen.	45 days	\$4.00 per diem	2	2	7	1,068,000,090	75	5.00	247,970	233,129	14,756	49,999	22,451	936,349	West Virginia
Blen.	None	\$500 per annum	4	2	13	2,743,180,494	.....	13.65	370,715	467,213	1,006	2,542	518,971	1,553,071	Wisconsin
Blen.	40 days	\$7.00 per diem	4	3	3	166,560,916	75	2.67	37,896	36,262	481	940	17,415	75,116	Wyoming

**Coast Line.**—As compared with Europe the coast of the United States has few indenting bays or projecting peninsulas, though the Gulf of Mexico is of considerable and commercial importance. Long Island sound, Delaware and Chesapeake bays, Albemarle and Pamlico sounds, the harbors of Charleston and Savannah, though not great geographical features, are of commercial importance. On the Pacific, Puget sound, the Bay of San Francisco, and the harbor of San Diego are almost the only noticeable breaks. Long Island is the largest of the islands.

**Surface.**—The two great mountain systems of North America, one along the western, the other near the eastern border, form the framework or skeleton of the physical structure. **Appalachian Region.**—In the east are the Appalachian mountains, from whose eastern base a coast plain extends to the sea. Narrow in Maine, the system grows gradually wider, until in North Carolina it attains a width of 200 miles. The southern coast region seldom exceeds 100 feet above the sea. It has a sandy soil, and many large swamps near the coast. The middle elevated region is diversified by hills and valleys, and has a productive soil.

**Mississippi Valley.**—West of the Appalachian system and lying between it and the western highland is the central valley, forming part of the great continental depression which extends from the Arctic Ocean to the Gulf of Mexico. It is almost an absolute plain, rising gradually from the Gulf toward the chain of great lakes in the north, and toward the mountains on the east and west. The only important departure from the level is the ridge of the Great Smoky mountains, to 2,000 feet, running from northern Missouri through northwestern Arkansas.

This great valley occupies about half the entire area of the United States, and the fertile prairies and bottom lands of the eastern and central portions make it the most important agricultural basin of the globe. From an irregular line west of the Mississippi river the land rises in an almost imperceptible slope till it reaches the base of the western plateau. Much of this region, known as the great plains, has a light rainfall, but affords admirable pasturage.

**Rocky Mountain Region.**—The western or Rocky system of mountains is a great plateau of 4,000 to 10,000 feet surmounted by a complex system of ranges, in its widest part more than 1,000 miles broad.

Of this region the Rocky mountains form the eastern and the Sierra Nevada and Cascade mountains and the Coast ranges the western border. In the ranges of central Colorado alone nearly forty of the summits have an altitude of more than 14,000 feet. In the Rocky mountains of Wyoming and Montana are the headwaters of the three great river systems of the United States—those of the Colorado, Columbia, and the Mississippi. Between the Wahsatch range and the lofty mountains in Colorado is a region furrowed by canyons or gorges, whose sides are nearly vertical; and the bed of the Colorado is in some places more than a mile and a quarter below the surface of the plateau.

**American Desert.**—Between the Wahsatch range and the Sierra Nevada lies the Great Basin, much of it an absolute desert.

**Pacific Coast Region.**—The Sierra Nevada and the Cascade range are topographically continuous. Most of the peaks of the Sierras are, however, of granite and metamorphic rock, while those of the Cascade range are volcanic. The greatest altitude is attained in Whitney; the sublimity of the scenery is justly celebrated. From 40 degrees north there extends northward one of the most remarkable groups of extinct or faintly active volcanoes to be found anywhere in the world; the lava overflows in this region cover an area of upward of 200,000 square miles. The passage of the Columbia river is a grand canyon more than 3,000 feet in depth. North of the Great Basin, between the Cascade range and the Rocky mountains, is the northern or Columbian plateau. The Shoshone falls of the Snake river probably rank next to Niagara in grandeur. Between the Coast range

and the Sierra Nevada, and Cascade ranges is a series of broad valleys, in Oregon that of the Willamette, and in California those of the Sacramento and the San Joaquin.

**Rivers and Lakes.**—Beside the chain of great lakes which forms a part of the northern boundary, there are thousands of lakes in the New England states and in New York, nearly ten thousand in Minnesota, and numerous mountain lakes among the Cordillera. The peculiar lacustrine character of the northern portion of the United States is undoubtedly a legacy of the glacial period.

The drainage areas may be broadly classified as the great lake or St. Lawrence, the Atlantic, the Pacific, and the Great Basin or interior systems of drainage.

The Atlantic system might be subdivided into two classes, one comprising the streams

flowing directly to the sea, the other comprehending those of the central valley which discharge their waters into the Gulf of Mexico. Among the rivers of the Atlantic are the Penobscot, Kennebec, Merrimack, Thames and Connecticut in New England, the Hudson, Delaware, Susquehanna, Potomac, James, Roanoke, Neuse, Cape Fear, Great Pedee, Santee, Savannah, Altamaha, and St. John's.

The Mississippi-Missouri, with its tributaries, the Ohio, Platte, Arkansas and Red rivers, is the chief stream of the central valley, and in length and extent of navigable water it surpasses all other rivers of the world. East of the Mississippi are the Mobile and Appalachicola, and to the west the Sabine, Brazos, and Rio Grande.

The Colorado, the Sacramento and San Joaquin, the Willamette and the Columbia are the chief rivers emptying into the Pacific.

#### CHIEF AMERICAN RIVERS

Name	Length in Miles	Source	Mouth
Alabama	175	Junction of Coosa and Tallapoosa, Ala.	Mobile river.
Allegheny	450	Allegheny county, N. Y.	Ohio river.
Andrews	140	Embargo lake, Me.	Atlantic Ocean
Arkansas	2170	Rocky mountains, N. C.	Mississippi river
Black	126	Highland lakes, N. Y.	Lake Ontario
Black Warrior	360	Formed by Locust and Mulberry forks, Ala.	Mississippi river
Brazos	750	Adirondack, N. Y.	Atlantic Ocean
Cape Fear	250	Junction of Haw and Deep rivers, N. C.	Atlantic Ocean
Chesapeake	430	Allegheny mountains, Pa.	Atlantic Ocean
Chowan	250	Mott and McNeill, N. C.	Atlantic Ocean
Colorado	690	Llano Estacado, Texas	Gulf of Mexico
Columbia	1400	Junction of Colorado and Grand rivers, Utah	Atlantic Ocean
Connecticut	410	Lewis and Clark's fork	Pacific Ocean
Coosa	275	Connecticut lake, Vt.	Lake Ontario
Cumberland	600	Junction of Coosawalla and Etowah rivers, Ga.	Ohio river
Delaware	400	Junction of Poor and Straight forks, Ky.	Delaware bay
Des Moines	375	Catakill mountain, N. Y.	Mississippi river
Flint	400	Lake Stetick, Mich.	Atlantic Ocean
Genesee	145	Allegheny mountains, Ga.	Atlantic Ocean
Grand	200	Allegheny county, N. Y.	Lake Ontario
Grand	200	Allegheny mountains, N. M.	Mississippi river
Grand	200	Southern Iowa	Missouri river
Grand	200	Highlands, Mich.	Lake Michigan
Grande del Norte	1800	Rocky mountains, Colo.	Atlantic Ocean
Great Pedee	380	Yadkin river, N. C.	Atlantic Ocean
Green	520	Cumberland mountains, Ky.	Ohio river
Honolauloe	520	Tagalaie mountains, Nava.	Indian Ocean
Hudson	280	Lake Sanford, Adirondack mountains, N. Y.	New York bay
Illinois	445	Des Plaines river, Wis.	Mississippi river
Kalamazoo	430	Jackson and Fox rivers, N. C.	Chesapeake bay
Kanawha	200	Highlands, Mich.	Lake Michigan
Kaskaskia	320	Junction of Greenbrier and New rivers, Va.	Ohio river
Kennebec	900	Rocky hills, Me.	Atlantic Ocean
Kentucky	320	Grand Prairie, Ill.	Mississippi river
Lewis Fork	100	Moosehead lake, Me.	Atlantic Ocean
Memnonine	300	"Forks" Cumberland mountains, Ky.	Ohio river
Merrimack	130	Rocky mountains, Ore.	Columbia river
Minnesota	364	Junction Brule and Mesquameum rivers, Wis.	Green bay
Mississippi	1500	White mountains, N. H.	Atlantic Ocean
Missouri	1200	Eastern Dakota	Mississippi river
Muhawk	135	Lisa lake, Minn.	Gulf of Mexico
Munongahela	300	Rocky mountains, Mont.	Mississippi river
Nahavaka	120	Oreida county, N. Y.	Hudson river
Nechas	180	Rich mountains, W. Va.	Ohio river
Neuse	250	Junction of Sweetwater and North Fork, Wyo.	Atlantic Ocean
Ocmulgee	250	Highlands, Wis.	Green bay
Ohio	950	Tallands, N. C.	Pamlico sound
Omaha	460	Allegheny mountains, Ga.	Atlantic Ocean
Pennobscot	270	Range county, N. Y.	Mississippi river
Potomac	380	George county, N. Y.	Chesapeake bay
Red	1600	East Seberson lake, Me.	Atlantic Ocean
Red (of the North)	700	Allegheny mountains, Md.	Chesapeake bay
Roanoke	205	Allegheny mountains, Md.	Atlantic Ocean
Sabine	400	Indian Lake, Minn.	Winnipeg lake
Sacramento	400	Ian and Platte, Wyo.	Albermarle sound
St. Croix	400	Highlands, Tex.	Gulf of Mexico
St. Francis	400	Sierra Madre mountains, Cal.	San Francisco bay
St. John	230	Ontonagon river, Wis.	Mississippi river
St. Joseph	230	St. Ignace, Mich.	Mississippi river
St. Lawrence	250	Everglades, Fla.	Atlantic Ocean
San Juan	350	Highlands, Ind.	Lake Michigan
Savannah	340	Sierra Nevada mountains, Cal.	Atlantic Ocean
Susquehanna	200	Junction of Wateree and Congaree, N. C.	Atlantic Ocean
Susquehanna	617	Allegheny mountains, S. C.	Atlantic Ocean
East Branch	216	Tallands, Ohio.	Ohio river
West Branch	208	Osteo lake, N. Y.	Susquehanna R.
Main	153	Allegheny mountains, N. Y.	Chesapeake bay
Tallapoosa	175	Junction of east and west branches, Pa.	Alabama river
Tennessee	1200	Allegheny mountains, Ga.	Ohio river
Tombigbee	475	Allegheny mountains, Miss.	Mobile river
Trinity	200	Highlands, Texas	Gulf of Mexico
Wabash	420	Allegheny mountains, N. C.	Ohio river
Wahsatch	450	Potomac hills, Ark.	Red river
White	650	Boston mountains, Ark.	Arkansas river
Willamette	400	Cascade, Ore.	Columbia river
Winconsin	400	Ontonagon river, Wis.	Mississippi river
Yadon	400	Junction of Goldwater and Tallahassee rivers, Miss.	Mississippi river
Yellowstone	200	Yellowstone lake	National river
Yukon	2000	Eastern Alaska	Behring bay



**Climate.**—The United States, stretching over such a vast area and having such great tracts of mountain and plain, must necessarily present a great variety of climate. The mean annual temperature ranges from under 40 degrees to 75 degrees. The inclination of 55 degrees mean annual temperature crosses the center of the country from east to west, passing through St. Louis. Places in the latitude of New York and Chicago have nearly the same mean temperature for the year as the British isles. The mean annual rainfall for the whole country is about 30 inches, but there is a great difference in this respect between different parts. The rainfall is most abundant on the northwest Pacific coast, on the gulf coast, and on the higher mountain ranges. On the great plains it is only 10 to 20 inches, and there are large desert stretches in the Rocky mountain region with a rainfall of less than 10 inches.

**Vegetation.**—The distribution of forests is greatly determined by rainfall. East of the great plains the country is well wooded, but the great plains themselves and a great part of the mountain region are almost treeless. In the Pacific States, and especially in California there are extensive forests of valuable conifers, including pines, redwood, and sequoias. The principal trees of the east are white pine, now becoming scarce, yellow pine in several varieties, walnut, chestnut, oak, poplar, cherry, spruce, balsam, and hemlock. There is wide variety in the vegetation, which is semitropical in the south and has a more temperate character in the north. The western deserts are characterized by cactuses, the yucca, and the sagebrush.

**Animal Life.**—Among the principal native animals, some almost exterminated, are elk, deer, moose, caribou, bison or buffalo, the American elk, the big-horn or Rocky moun-

tain sheep, the Rocky mountain goat, prairie dogs, coyotes, foxes, opossums, and jack rabbits. The rattlesnake and other snakes are notable among reptiles.

**Birds, Reptiles, Fish.**—The birds include the great white-headed eagle, osprey, and eagles of various sizes, and a multiplicity of smaller birds of kinds generally common to the world, but a few of which, such as the Baltimore oriole, mocking-bird, etc., are peculiar to this country.

The reptiles furnish many varieties of both poisonous and innocuous serpents; the alligator is an inhabitant of the southern rivers, and the venomous insect—mosquito—in particular—are more plentiful than agreeable.

The coasts and rivers of the republic teem with fish of the finest edible descriptions—cod, mackerel, salmon, trout, bass, shad, etc.—and the mollusks and cetacean varieties are amply represented.

## POPULATION OF CITIES OF THE UNITED STATES, CENSUS OF 1910

TABLE I. CITIES OVER 100,000 POPULATION

Note.—The index notations following names of cities indicate their location on the respective maps. Thus 6-N-5 means that Albany is located on map 6 at, or near, the junction of the lines N and 5.

NAME	POPULATION 1910	PER CENT INCREASE 1900-1910	NAME	POPULATION 1910	PER CENT INCREASE 1900-1910	NAME	POPULATION 1910	PER CENT INCREASE 1900-1910
Albany, N. Y. (6-N-5)	100,253	6.5	Indianapolis, Ind. (10-E-5)	223,650	38.1	*Philadelphia, Pa. (8-M-7)	1,549,008	19.7
Albany, Pa. (6-N-5)	154,839	72.3	Jersey City, N. J. (7-H-1)	397,719	29.7	Pittsburg, Pa. (6-E-8)	533,905	18.2
Albany, Md. (2-E-5)	128,685	9	Kansas City, Mo. (4-C-2)	248,881	21.5	Portland, Ore. (4-C-2)	267,214	12.2
Birmingham, Ala. (31-E-3)	122,685	24.5	Los Angeles, Cal. (45-G-3)	319,198	21.5	Providence, R. I. (4-E-6)	224,238	27.8
*Boston, Mass. (4-E-1)	670,585	19.6	Louisville, Ky. (29-H-4)	122,628	9	Richmond, Va. (32-E-5)	147,628	50.1
Bridgport, Conn. (C-9-4)	102,051	10	Lovell, Mass. (4-E-3)	108,294	20.8	Richmond, N. C. (2-E-5)	118,149	18.4
Buffalo, N. Y. (6-C-5)	423,715	20.2	Memphis, Tenn. (30-A-4)	131,105	28.1	St. Louis, Mo. (10-M-4)	687,029	19.1
Cambridge, Mass. (4-E-4)	104,839	14.1	Milwaukee, Wis. (13-E-9)	375,857	31.0	St. Paul, Minn. (14-E-4)	214,744	31.7
Chicago, Ill. (11-E-2)	2,839,353	35.8	Minneapolis, Minn. (14-E-9)	301,208	28.8	San Francisco, Cal. (40-C-3)	416,912	36.6
Cincinnati, Ohio (4-E-5)	363,591	11.8	Nashville, Tenn. (30-H-2)	110,364	36.5	Scranton, Pa. (8-L-4)	129,867	27.3
Cleveland, Ohio (9-H-1)	560,653	46.9	Newark, N. J. (7-H-4)	247,469	41.1	Seattle, Wash. (43-E-5)	237,194	104.0
Columbus, Ohio (9-E-4)	181,418	19.1	San Antonio, Tex. (5-D-4)	133,081	29.7	Shelton, Conn. (43-E-5)	127,938	36.6
Dayton, Ohio (9-C-5)	116,577	36.6	*New Orleans, La. (33-J-7)	339,075	18.1	Syracuse, N. Y. (9-H-4)	137,249	26.6
Denver, Colo. (38-J-3)	213,851	69.4	New York, N. Y. (6-N-9)	4,766,883	38.7	Toledo, Ohio (1-D-1)	168,497	27.3
Detroit, Mich. (12-F-6)	465,766	63.3	Oakland, Cal. (46-E-3)	150,174	124.3	Washington, D. C. (22-E-6)	331,099	18.8
Fall River, Mass. (4-K-7)	110,295	13.8	Omaha, Neb. (10-J-3)	124,096	21.0	Worcester, Mass. (4-G-4)	145,996	22.3
Grand Rapids, Mich. (12-D-5)	112,571	28.6	Paterson, N. J. (7-H-3)	125,000	19.4			

TABLE II. CITIES FROM 25,000 TO 100,000 POPULATION

Akron, Ohio (9-H-2)	69,007	61.6	Fort Wayne, Ind. (10-G-2)	65,933	41.7	Newport, Ky. (20-L-3)	30,369	7.1
Albany, Pa. (6-N-5)	61,913	43.6	Fort Worth, Tex. (35-E-7)	73,131	174.1	New Rochelle, N. Y. (6-N-9)	21,449	21.0
Altoona, Pa. (9-F-5)	52,127	33.3	*Galveston, Texas (35-J-8)	29,981	21.7	New Rochelle, N. Y. (6-N-9)	28,867	96.1
Amsterdam, N. Y. (6-M-5)	31,267	49.4	Great Bay, Wis. (13-E-9)	25,236	55.1	Newton, Mass. (4-K-4)	39,808	18.5
Atlantic City, N. J. (7-G-9)	46,158	65.8	Hannibal, Mo. (30-E-6)	35,279	47.5	Niagara Falls, N. Y. (6-E-4)	30,413	86.6
Auburn, N. Y. (6-O-5)	34,668	14.2	Harrisburg, Pa. (8-J-6)	61,196	27.7	Norfolk, Va. (23-F-7)	67,452	44.7
Augusta, Ga. (27-F-4)	41,049	4.4	Hartford, Conn. (6-E-2)	69,915	23.9	Norristown, Pa. (8-M-6)	27,675	25.2
Aurora, Ill. (11-H-2)	29,807	23.4	Harrison, Ohio (9-B-6)	41,118	18.7	Orden, Utah (30-E-2)	35,880	56.8
Austin, Texas (35-F-7)	29,660	34.2	Hartford, Conn. (6-E-2)	20,452	78.9	Oklahoma City, Okla. (21-F-4)	64,235	639.7
Battle Creek, Mich. (12-D-6)	25,267	36.1	Hoboken, N. J. (7-H-1)	70,224	18.5	Orange, N. J. (7-H-3)	29,630	22.7
Bay City, Mich. (12-E-6)	45,466	63.5	Harrisburg, Mass. (4-K-2)	57,730	26.3	Ogkush, Wis. (13-J-7)	33,962	16.9
Bayonne, N. J. (7-H-4)	55,545	69.7	Houston, Texas (39-H-5)	78,900	76.6	Paducah, Ky. (40-G-8)	20,291	232.2
Berkshire, Cal. (6-C-5)	40,434	206.0	Huntington, W. Va. (24-B-5)	31,161	161.4	Pasadena, Cal. (40-G-8)	64,778	97.2
Birmingham, N. Y. (6-N-5)	48,443	22.2	Jackson, Mich. (12-E-6)	31,433	21.8	Pawcatuck, Conn. (4-E-4)	31,622	31.5
Bloomington, Ill. (11-F-5)	25,768	10.7	Jacksonville, Fla. (28-H-2)	57,099	103.5	Peoria, Ill. (11-E-4)	66,950	19.3
Brockton, Mass. (4-K-3)	56,878	42.0	Jersey City, N. J. (7-H-1)	31,287	36.7	Perth Amboy, N. J. (7-G-4)	33,121	81.6
Brookline, Mass. (6-E-4)	56,878	42.0	Little Rock, Ark. (34-F-6)	43,941	19.9	Philadelph, Pa. (8-M-7)	1,549,008	19.7
Butte, Mont. (41-D-4)	39,165	28.5	Joliet, Ill. (11-H-2)	31,670	19.1	Portland, Me. (2-C-8)	68,871	16.8
Camden, N. J. (7-D-7)	94,838	24.5	Joplin, Mo. (10-F-7)	32,073	23.2	Portsmouth, Va. (23-F-7)	53,190	90.8
Canton, Ohio (10-E-4)	63,718	63.7	Kansas City, Mo. (4-C-2)	248,881	21.5	Portsmouth, Va. (23-F-7)	53,190	90.8
Cedar Rapids, Iowa (15-F-5)	32,811	27.9	Kansas City, Mo. (4-C-2)	248,881	21.5	Pueblo, Colo. (38-E-4)	44,395	67.9
Charleston, S. C. (26-H-6)	56,833	5.4	Kingsport, N. Y. (6-M-7)	25,938	5.6	Quincy, Ill. (11-E-6)	36,942	57.9
Chattanooga, Tenn. (30-L-4)	44,604	47.8	La Crosse, Wis. (12-D-8)	30,417	5.3	Racine, Wis. (13-L-10)	38,002	30.6
Chelsea, Mass. (4-E-4)	32,452	4.8	Lancaster, Pa. (8-K-6)	47,227	13.9	Reading, Pa. (8-L-6)	96,071	21.7
Cherter, Pa. (6-M-7)	26,507	12.4	Lebanon, Ohio (12-E-6)	30,417	5.3	Rensselaer, N. Y. (6-E-4)	34,974	62.3
Chester, Mass. (4-E-5)	24,401	32.5	Lawrence, Mass. (4-K-3)	85,892	27.3	Rockford, Ill. (11-F-1)	45,401	46.2
Clinton, Iowa (15-F-5)	25,577	12.7	Lebanon, Mo. (12-E-6)	26,317	10.3	Sacramento, Cal. (46-D-4)	144,998	19.3
Colorado Springs, Col. (38-J-3)	59,078	37.9	Lebanon, Mo. (12-E-6)	26,317	10.3	Saginaw, Mich. (11-E-4)	60,510	19.3
Columbia, S. C. (20-E-4)	29,319	21.7	Lima, Ohio (9-C-3)	30,508	49.4	St. Joseph, Mo. (16-C-2)	77,493	24.8
Cornell Bluffs, Ia. (16-B-6)	29,252	13.5	Lincoln, Neb. (10-H-1)	43,973	9.5	Salem, Mass. (4-E-1)	92,777	73.2
Cornwall, N. Y. (6-N-5)	43,028	21.8	Little Rock, Ark. (34-F-6)	43,941	19.9	Salt Lake City, Utah (35-E-8)	96,814	81.2
Dallas, Texas (35-G-5)	92,104	110.0	Lorain, Ohio (9-G-2)	28,863	80.2	San Antonio, Texas (35-E-8)	96,814	81.2
Dayton, Ill. (11-J-5)	27,871	70.1	Lynchburg, Va. (23-J-6)	24,944	56.1	San Diego, Cal. (46-D-5)	29,946	34.6
Dayton, Ohio (9-E-4)	181,418	19.1	Lynn, Mass. (12-E-6)	40,565	74.7	San Jose, Cal. (46-D-5)	65,954	19.9
De Witt, Ill. (11-M-5)	31,149	50.0	Macou, Ga. (27-D-5)	40,565	74.7	Savannah, Ga. (27-E-4)	65,954	19.9
Des Moines, Iowa (15-F-5)	86,308	39.0	McKeesport, Pa. (8-C-6)	42,694	24.1	Schenectady, N. Y. (13-E-4)	26,308	18.8
Detroit, Mich. (12-F-6)	465,766	63.3	Madison, Wis. (12-E-6)	40,565	74.7	Schenectady, N. Y. (13-E-4)	26,308	18.8
Duluth, Minn. (14-E-5)	78,496	45.1	Malden, Mass. (4-E-4)	44,401	21.9	Shenandoah, Va. (13-L-8)	25,774	29.0
Easton, Pa. (6-M-5)	28,523	13.0	Manchester, N. H. (3-J-10)	70,963	22.9	Shreveport, La. (25-E-2)	51,015	9.0
East Orange, N. J. (6-N-5)	39,808	39.8	Manassas, Conn. (20-D-3)	21,449	21.0	Sioux City, Iowa (15-K-4)	47,828	44.1
East St. Louis, Ill. (11-D-8)	58,547	97.4	*Mobile, Ala. (31-B-9)	51,521	33.9	Somerville, Mass. (4-A-4)	77,236	25.3
El Paso, Texas (45-F-7)	39,279	146.9	Montgomery, Ala. (31-F-6)	35,136	25.7	South Bend, Ind. (10-E-1)	55,564	49.1
Elgin, Ill. (11-H-1)	33,678	19.8	Montpelier, Vt. (12-E-6)	25,000	49.1	Springfield, Ill. (11-E-6)	51,678	51.3
Elizabeth, N. J. (7-H-4)	73,409	40.8	Muskogee, Okla. (21-L-3)	25,000	49.1	Springfield, Mass. (16-D-5)	58,926	62.3
Elmira, N. Y. (6-G-6)	37,176	4.2	Nashua, N. H. (3-J-10)	25,000	49.1	Springfield, Mo. (16-F-7)	33,201	51.3
Elm, Ga. (8-B-2)	26,317	10.3	New Bedford, Mass. (4-L-7)	96,832	54.4	Springfield, Ohio (9-D-5)	46,921	22.7
Evansville, Ind. (10-B-9)	69,647	18.6	New Britain, Conn. (15-D-3)	42,916	66.0	Stamford, Conn. (46-D-5)	43,384	29.9
Everett, Mass. (4-K-4)	33,481	37.6	New Britain, Conn. (15-D-3)	42,916	66.0	Superior, Wis. (13-B-2)	50,743	122.0
Flint, Mich. (12-F-6)	38,580	104.2	Newcastle, Pa. (8-H-5)	26,280	21.0	Tacoma, Wash. (43-C-3)	63,283	122.0

Principal seaports.

## POPULATION OF CITIES OF THE UNITED STATES—Continued

TABLE 11. CITIES FROM 25,000 TO 100,000 POPULATION—Continued

NAME	POPULATION 1910	PER CENT INCREASE 1900-1910	NAME	POPULATION 1910	PER CENT INCREASE 1900-1910	NAME	POPULATION 1910	PER CENT INCREASE 1900-1910
Tampa, Fla. (28-G-7)	37,782	138.6	Warwick, R. I. (4-J-7)	26,829	24.6	Williamsport, Pa. (8-H-4)	31,660	14.8
Taunton, Mass. (4-K-5)	34,259	10.8	Waterbury, Conn. (2-C-3)	30,921	24.6	Wilmington, Del. (2-K-2)	31,660	10.8
Terre Haute, Ind. (10-C-6)	58,157	52.0	Watson, Iowa (15-J-4)	29,693	112.3	"Wilmington, N. C. (25-C-8)	28,748	22.7
Texas, Kan. (20-N-4)	63,684	20.0	Waterson, N. Y. (8-J-3)	26,750	22.0	Winchester, N. H. (4-I-6)	31,715	20.0
Trenton, N. J. (7-E-6)	96,815	32.1	West Hoboken, N. J. (7-H-3)	35,403	113.3	Yonkers, N. Y. (6-N-9)	79,953	86.6
Troy, N. Y. (6-N-5)	76,813	26.6	Wheeling, W. Va. (24-E-1)	41,641	7.1	York, Pa. (5-J-7)	44,750	32.8
Utica, N. Y. (4-K-4)	43,119	42.6	White, Kan. (20-K-7)	27,115	29.7	Youngstown, Ohio (8-K-2)	52,626	19.8
Waco, Texas (35-F-6)	26,425	27.7	Wilkes-Barre, Pa. (8-L-4)	67,105	29.7	Zanesville, Ohio (9-G-6)	28,036	19.8

TABLE III. CITIES AND OTHER INCORPORATED PLACES OF 7,000 TO 25,000 INHABITANTS

<b>Alabama</b>	Pop.	<b>Illinois—Continued</b>	Pop.	<b>Kansas—Continued</b>	Pop.	<b>Mississippi—Continued</b>	Pop.
Anniston (31-G-3).	12,794	Dixon (11-F-2).	94,716	Pittsburg (20-P-8).	14,758	Greenville (32-B-8).	9,010
Basement (31-E-4).	1,000	Evansville (11-A-9).	94,079	Salina (20-J-5).	7,084	Hattiesburg (32-B-8).	11,733
Birmingham (31-B-3).	7,016	Freeport (11-B-2).	17,361	Wichita (20-K-8).	9,084	Jackson (32-B-8).	11,733
Gadsden (31-G-2).	10,657	Granite City (11-D-4).	22,069	<b>Kentucky</b>		Laurel (32-F-7).	8,165
Huntsville (31-E-1).	7,811	Granite City (11-D-5).	9,933	Ashland (29-O-4).	8,888	Meridian (32-C-5).	23,265
Indianapolis (31-E-2).	13,649	Greenville (11-D-3).	15,026	Booneville (29-F-7).	11,405	Natchez (32-B-8).	20,814
Tuscaloosa (31-C-4).	8,407	Jacksonville (11-D-8).	15,026	Frankfort (20-K-4).	10,465	<b>Vicksburg (32-C-5).</b>	20,814
<b>Arizona</b>		Kankakee (11-J-3).	13,986	Henderson (29-D-5).	7,452	<b>Missouri</b>	
Bloom (37-L-3).	9,019	Lansing (11-E-3).	8,307	Keokuk (29-D-5).	11,305	Cape Girardeau (16-N-7).	8,475
Globe (37-F-9).	7,083	Laskala (11-F-3).	11,537	Middleboro (29-M-7).	11,405	Carthage (16-D-7).	9,483
Phoenix (37-G-9).	11,134	Lincoln (11-F-5).	10,892	Owensboro (29-L-5).	16,011	Columbia (16-H-4).	9,850
<b>Arkansas</b>		Madison (11-G-10).	7,090	Monroe (29-B-7).	10,449	Hannibal (16-C-4).	9,850
Argenta (34-F-9).	11,138	Mattoon (11-H-7).	11,456	Winchester (29-L-5).	7,156	Independence (16-D-3).	9,850
Bay (34-B-3).	23,975	Maywood (11-B-10).	8,033	<b>Louisiana</b>		Jefferson City (16-H-4).	11,138
Helena (34-J-4).	8,772	McClure (11-C-3).	9,128	Alexandria (33-G-6).	11,913	Mobile (16-B-4).	9,437
Hot Springs (34-D-4).	14,439	Mt. Vernon (11-G-9).	8,007	Baton Rouge (33-G-6).	12,827	Nevada (16-D-6).	7,156
Indianapolis (34-J-2).	14,439	Murphy (11-G-10).	8,007	Lake Charles City (33-C-6).	11,449	St. Charles (16-L-4).	9,437
Pine Bluff (34-G-5).	15,152	Oak Park (11-G-10).	10,444	Monroe (33-B-7).	10,449	Webb City (16-B-7).	11,817
<b>California</b>		Ottawa (11-G-3).	9,635	<b>Maine</b>		Wester Gorges (16-M-4).	7,083
Alhambra (46-D-8).	23,383	Peabody (11-J-4).	7,664	Auburn (2-C-7).	15,064	<b>Montana</b>	
Bakersfield (46-G-7).	12,747	Pekin (11-E-4).	9,897	Augusta (2-D-7).	12,747	Anaconda (41-D-4).	10,134
Eureka (46-A-2).	11,849	Peru (11-F-3).	7,984	Bangor (2-F-6).	24,803	Bozeman (41-B-4).	10,134
Fontana (46-B-3).	11,849	Rose (11-C-3).	9,233	Bath (2-B-10).	9,396	Great Falls (41-E-3).	13,948
Long Beach (46-G-9).	11,849	Spring Valley (11-F-3).	7,035	Biddeford (2-F-6).	9,396	Helena (41-D-4).	12,511
Pomona (46-H-8).	10,207	Sterling (11-E-2).	7,467	Rockland (2-B-9).	8,174	Nebraska	
Riverside (46-B-3).	15,212	Union City (11-C-3).	8,445	Sanford (2-E-7).	9,049	Beatrice (10-H-4).	9,356
San Bernardino (46-H-8).	12,779	Urbana (11-H-3).	8,245	South Portland (2-C-8).	7,417	Grand Island (10-F-4).	10,326
San Diego (46-H-8).	8,445	Waukegan (11-D-1).	16,069	Waterville (2-D-6).	11,458	Hastings (19-F-4).	9,356
Santa Barbara (46-F-8).	11,659	<b>Indiana</b>		Westbrook (2-C-8).	8,251	<b>Nevada</b>	
Santa Rosa (46-C-4).	11,146	Anderson (10-F-1).	22,476	<b>Annapolis (22-N-4).</b>	8,609	Reno (45-B-3).	10,367
St. Louis (46-B-8).	11,146	Bedford (10-E-7).	8,716	Cumbersland (22-C-3).	21,839	<b>New Hampshire</b>	
Santa Rosa (46-C-4).	11,146	Bloomington (10-D-6).	8,716	Frederick (22-B-3).	10,411	Concord (3-H-9).	11,797
Stockton (46-D-5).	23,253	Columbus (10-F-6).	8,813	Hagerstown (22-H-3).	10,507	Dover (3-E-9).	13,247
Vallejo (46-C-4).	11,340	Connersville (10-G-5).	7,738	<b>Massachusetts</b>		Laconia (3-H-9).	10,806
<b>Colorado</b>		East Chicago (10-B-4).	9,437	Beverly (4-L-3).	18,550	Lewiston (3-E-9).	11,290
Boulder (38-H-2).	9,839	Elkhart (10-F-1).	19,068	Marlboro (4-H-4).	12,459	Portsmouth (3-L-9).	11,290
Colorado Springs (38-H-2).	7,754	Elkhart (10-F-1).	19,068	Medford (4-K-4).	13,450	<b>New Jersey</b>	
Grand Junction (38-A-4).	8,179	Elkhart (10-F-1).	19,068	Medford (4-K-4).	13,450	Asbury Park (7-H-6).	10,136
Greenlee (38-J-2).	10,179	Frankfort (10-D-4).	8,634	Newburyport (4-L-2).	21,019	Bloomfield (7-H-6).	15,072
Leadville (38-B-2).	8,179	Gary (10-C-1).	16,062	Northampton (4-B-3).	22,019	Dorchester (7-E-6).	7,436
Trinidad (38-B-2).	8,179	Hammond (10-B-1).	20,925	Warren (4-H-4).	15,308	Burlington (7-E-6).	7,436

\*Principal scapula.

POPULATION OF UNITED STATES—Continued

TABLE III. CITIES AND OTHER INCORPORATED PLACES OF 7,000 TO 25,000 INHABITANTS—Continued

<b>New York—Continued</b>	<b>Pop.</b>	<b>Ohio—Continued</b>	<b>Pop.</b>	<b>Pennsylvania—Continued</b>	<b>Pop.</b>	<b>Texas—Continued</b>	<b>Pop.</b>
Little Falls (6-L-4)	12,273	Norwalk (9-F-2)	7,558	McKees Forks (3-B-6)	14,702	Denison (33-U-4)	13,632
Lockport (6-C-4)	17,970	Norwood (9-C-6)	16,185	Mahanoy City (3-K-6)	15,936	Denison (33-U-4)	7,824
Middleton (6-L-4)	12,914	Northampton (9-B-2)	12,914	Marysville (3-B-7)	13,740	Delaware (33-D-4)	7,824
North Tonawanda (9-C-4)	11,955	Portsmouth (9-E-7)	23,481	Milvale (3-C-6)	7,861	Gareville (43-D-10)	14,855
Norwich (6-F-3)	7,442	Salem (9-C-6)	8,943	Milton (3-J-4)	7,860	Marshall (33-I-4)	11,432
Oneida (6-L-4)	12,914	Salem (9-F-2)	19,970	Milton (3-J-4)	7,860	Marshall (33-I-4)	11,432
Oran (6-L-6)	14,743	Steubenville (9-K-4)	22,391	Monaca (3-C-6)	11,775	Marshall (33-I-4)	11,432
Oneida (6-F-4)	8,317	Tiffin (9-F-2)	11,894	Monaca (3-C-6)	7,798	Port Arthur (33-K-9)	7,863
Oran (6-L-6)	12,914	Union (9-B-2)	7,861	Monaca (3-C-6)	7,798	Port Arthur (33-K-9)	7,863
Osmine (9-N-8)	11,490	Van Wert (9-B-3)	7,157	Nanticoke (3-I-4)	18,577	Sherman (33-G-4)	12,612
Oswego (9-I-4)	23,368	Wagon (9-K-2)	11,081	New Brighton (3-B-5)	8,327	Temple (33-F-4)	10,970
Ottawa (9-F-2)	12,914	Washington Court (9-E-3)	7,277	New Kensington (3-C-6)	7,861	Texas (33-F-4)	7,790
Plattsburg (6-U-1)	11,138	Wellsville (9-K-3)	7,769	North Braddock (9-C-6)	11,824	Texas (33-F-4)	7,790
Port Chester (6-D-7)	12,869	Wellsville (9-K-3)	7,769	Northampton (9-N-5)	8,327	Tyler (34-B-8)	10,400
Port Jervis (6-I-D-8)	10,970	Wellsville (9-K-3)	7,769	Old Forge (9-L-4)	11,324	Utah (33-F-4)	8,925
Russell (6-N-8)	10,711	<b>Oklahoma</b>	8,015	Old Forge (9-L-4)	11,324	<b>Utah</b>	8,925
Rome City (6-K-4)	20,497	Ardmore (21-F-6)	8,015	Olyphant (3-L-4)	8,943	Utah (33-F-4)	8,925
St. Albans (6-N-8)	12,914	Chickasha (21-F-6)	8,015	Olyphant (3-L-4)	8,943	<b>Vermont</b>	8,925
Towanda (6-K-4)	8,290	El Reno (21-F-6)	8,782	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Watervliet (9-N-8)	15,074	Lawton (21-F-6)	13,799	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Watervliet (9-N-8)	15,074	Lawton (21-F-6)	13,799	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
<b>North Carolina</b>	15,949	Lawton (21-F-6)	13,799	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Ashville (23-D-2)	18,763	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Durham (23-M-4)	18,763	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Elizabeth (23-D-2)	8,412	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Fayetteville (23-K-1)	15,949	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Greensboro (23-K-1)	15,949	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
High Point (23-K-2)	9,525	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Wilmington (23-K-2)	9,525	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Raleigh (23-M-4)	19,218	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Rocky Mount (23-O-2)	9,561	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Wilmington (23-K-2)	9,561	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
Wilmington (23-K-2)	9,561	McAlester (21-K-5)	12,954	Plymouth (3-K-4)	16,990	Barnes (3-D-8)	10,734
<b>North Dakota</b>	17,187	<b>Pennsylvania</b>	8,192	<b>Oregon</b>	8,192	<b>Washington</b>	8,192
Fargo (17-J-4)	14,421	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194
Grand Forks (17-H-3)	14,238	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194
<b>Ohio</b>	14,238	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194
Allison (9-J-3)	15,083	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194
Ashtabula (9-K-1)	18,266	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194
Bellevue (9-K-4)	9,410	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194	Beaver Falls (9-B-5)	7,194
Bellevue (9-K-4)	9,410	Beaver Falls (9-B					

**Insular Possessions.**—The Philippine islands form a large group of the Asiatic archipelago, from which it is separated by the two deep abysses of the Sulu (Mindoro) and Celebes Seas, 2000 to 4,000 fathoms deep. It is washed on the east side by the Pacific Ocean and on the northwest by the China Sea, and comprises an aggregate of over 2000 islands of all sizes, ranging from mere islets and reefs to Luzon and Mindanao, the former rather more, the latter somewhat less, than 40,000 square miles in area.

The other chief members of the group, collectively called *Vizcaya*, are *Mindoro*, 9,000 square miles; *Palawan* (Paraguas), 10,000; *Luw*, 3,000; *Cebu*, 10,000; *Bohol*, 2,000; *Maribato*, 1,200. *Surfosa* and *Rivera*—Two main ridges ramify the island of *Mindoro*, the highest peak being *Apog* in the southeast of *Mindoro* (10,400 feet). The shore lines and internal structure of the larger islands are extremely rugged and mountainous. The islands are clothed with a gigantic and ever-teeming vegetation; and between these life-extensive slopes are places of the richest tropical forest, watered by numerous lakes and rivers which afford abundant means of irrigation and transport.

**Climate.**—The climate on the whole is healthy, but hurricanes are common. Earthquakes are frequent, and often very destructive. Owing to the prevailing sea breezes, the climate, although moist and hot, is less insalubrious than that of most tropical lands. The temperature varies from about 77° in December to 96° in May.

**Vegetation.**—The magnificent primeval forests contain dyewoods, hard-grained timbers, and medicinal and other useful plants. The principal agricultural product is rice, and next in importance are sugarcane, tobacco, and coffee. Fibrous

plants are also abundant, and among the chief of these are the well-known mule hemp, the cotton plant, the gomuti palm, ramie, etc. The pineapple is grown both for its fiber and its fruit. **Animals and Minerals.**—The largest wild mammal is the buffalo, and next to it the gibbon; there are several other species of apes and lamurs, antelopes and deer. The earliest man is represented by the species *Pithecanthropus*, the inferior by the *porcupine*. The only dangerous animals are the crocodile, snakes, and some other reptiles.

Birds are very numerous, of the gallinaceous family especially. Insects are very various; and the forest trees and shrubs were abundant in fables, turtles, mollusks, and sponges.

Of minerals the most widely diffused are coal and iron; copper also occurs, as well as gold, lead, silver, and tin. The common stones are besides jasper, marble, and fine building stones.

*Veget.*—Besides Manila, the capital, there are several other considerable towns: *Batang, Lipa, San Francisco, Zamboanga, Zamboanga, Zamboanga, Zamboanga.*

*People.*—The original inhabitants of the Philippines were undoubtedly the Negroes, now reduced to a few remnants. They were supplanted by new races, the Malays, who are now the most numerous, at least 20,000. Half-caste Negro communities are extremely numerous, the indigenous element

having amalgamated with the intruding Indonesian and Malay peoples. The Indonesians (akin to the Polynesians) are mostly pagans, whereas nearly all the Malays are either Roman Catholics or Mohammedans. The Tagal and Visayan languages are the predominant types.

**History.**—Discovered in 1521 by Magellan, who was killed here, the Philippines were officially annexed to Spain in 1569, and till 1898 remained an integral part of the Spanish dominion. A rebellion in 1896 went on till the Spanish-American war was begun in 1898. As a result of the Philippine war

of 1898 the islands were ceded to the United States on a payment of \$20,000,000.

the Hawaiian Islands are a group of eight inhabited and four uninhabited islands in the North Pacific. They were annexed to the United States in 1898, attached to the department of California for military purposes, and made a territory in 1900, with one delegate in the United States Congress.

The administration is carried on by a governor with legislatures of two houses, a senate of 15 and a house of 30 members. The natives almost all profess the Christian faith, and education is free. **Sports.**—Sugar, rice, coffee, fruits and nuts, hides, skins, shells and bone. The bulk of the trade is with the United States. **Islands.**—The islands with America, Australia, China, and Japan. **Population** includes over 25,000 Chinese, over 60,000 Japanese, and about 28,000 whites. **History.**—Discovered by Christopher Columbus in 1493, rice, until 1898 a Spanish colony, but then ceded to the United States by the Spanish-American treaty of peace, lies to the east of San Domingo,

It is administered by a governor with an executive council, consisting of six officials and five natives appointed by the president, and a legislative assembly of thirty-five members elected for two years on a franchise restricted by a small property qualification and a low educational test. The island of Culebra, between Porto Rico and St. Thomas, has been made a United States naval base.

The island is mountainous, the climate healthy, and the chief exports are coffee, fruit, sugar, tobacco, and timber. Free trade between the island and the United States was inaugurated in July, 1901, with very beneficial results on the sugar and tobacco trades. The United States sends the great bulk of the imports and takes most of the exports. The population, census of 1910, is 1,118,012, of whom about 861,000 are negroes.

• **Principal reports:**

about 300,000 mulattoes, and about 500,000 whites. The chief towns are San Juan and Ponce.

**Samoa Islands.**—By an agreement between Great Britain and Germany concluded in 1899, and proved 1900 by the United States, the Samoa Islands, which lie in the Western Pacific, were divided. Upolu and Savaii being assigned to Germany, and Tutuila and the other Samoa Islands to the United States. Great Britain renouncing all her rights over the islands. Tutuila (area, 54 square miles, population 5,800) has the magnificent harbor of Pago Pago. The other islands all have an area of about 25 square miles, with about 2,000 inhabitants.

**Guam.** the largest of the Mariana and Ladrones islands, was ceded to the United States in 1898, for use as a coaling station. It has a good roadstead. Area about 200 square miles; population about 8,601. The capital is Agaña; population 6,000.

**Panama Canal Zone.**—Article two of the treaty between the United States and the republic of Panama, ratified by the United States Senate February 23, 1904, treaty in effect February 20, 1904, provided for the canal, in perpetuity, by Panama, of a strip of territory adjacent to the canal, as follows:

"The Republic of Panama grants to the United States in perpetuity the use, occupation, and control of the zone of land and land under water for the construction, maintenance, operation, sanitation, and protection of said canal of the width of ten miles, extending to the distance of five miles on each side of the center line of the route of the canal to be constructed; the said zone beginning in the Caribbean Sea, three marine miles from the low-water mark, and extending to and across the Isthmus of Panama into the Pacific Ocean to a distance of three marine miles from mean low water mark, with the proviso that the cities of Panama and Colon and the harbors adjacent to them, which cities, whether included within the area of the zone above described, shall not be included within this grant.

"The Republic of Panama further grants to the United States in perpetuity the use, occupation, and control of any other lands and waters outside the zone above described which may be necessary and convenient for the construction, maintenance, operation, sanitation, and protection of the said enterprise."

"The Republic of Panama further grants to the United States in perpetuity the use, occupation, and control of all islands within the limits of the zone above described, and in addition thereto the group of small islands in the Bay of Panama, called Perico, New Colón, and others."

**Panama Canal.**—The idea of connecting the Atlantic and Pacific Oceans by a canal across the Central American Isthmus arose as early as the 16th century; but no steps were taken to carry out any

plan until Ferdinand de Lesseps, of France (fame, conferred in Paris in 1879 an international congress to discuss the plan of cutting through the Isthmus of Panama).

On February 28, 1881, the first detachment of canal employees arrived at Colon; in 1882 the canal company purchased the Panama railway. An expedition was sent to Panama to locate a route, that a canal could be made for \$43,000,000 francs, but later De Lesseps announced that a tide-level lock was essential, and the project was abandoned, 300,000 francs.

Work was begun, and loans followed year after year, until the company was forced into liquidation in 1895. The Panama scandal (see 1895) with prosecutions and imprisonments (De Lesseps, 1895).

In 1902 the United States arranged to purchase the existing works, with the right to finish the canal, but the necessary treaty was rejected by Colombia in 1903, where the republic of Panama revolted, and the new republic signed a treaty (see above) with the United States in November 1903, giving the United States full control of a strip of land on either side of the canal, which is practically a detachment of the Isthmus of Panama.

**Factor Concerning Construction.**—The canal is to be about 50 miles in length from deep water in the Caribbean Sea to deep water in the Pacific Ocean. The distance from deep water to the shore line in Limón Bay is about 4½ miles and from the Pacific shore line to deep water is about 10 miles. The length of the canal, from shore to shore will be approximately 40½ miles.

The channel from mile 0 in the Caribbean to mile 6.70 will be 500 feet wide from the south end of Gatun locks to mile 23.50 not less than 1,000 feet wide; from mile 23.50 to mile 20.50, 800 feet wide; from mile 20.50 to mile 700 feet wide; from mile 27.00 to mile 21.25, 500 feet wide; from mile 21.25 to Pedro Miguel lock (mile 39.30), 300 feet wide; and from Pedro Miguel lock to Miraflores locks and from Miraflores locks to deep water in Panama Bay, 500 feet wide.

The average bottom width of the channel in this project is 649 feet and the minimum bottom width is 300 feet.

The canal will have a minimum depth of 41 feet.

**Estimated Cost.**—The cost estimated by the present canal company is \$200,000,000 for the canal, which includes \$20,053,000 for sanitation and \$7,382,000 for civil administration.

The average bottom width of the canal is 649 feet and the minimum bottom width is 300 feet.

The canal will have a minimum depth of 41 feet.

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The average bottom width of the canal is 649 feet and the minimum bottom width is 300 feet.

The canal will have a minimum depth of 41 feet.

The average bottom width of the canal is 649 feet and the minimum bottom width is 300 feet.

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The average bottom width of the canal is 649 feet and the minimum bottom width is 300 feet.

The canal will have a minimum depth of 41 feet.

The average

## TRAVEL DISTANCES BETWEEN IMPORTANT CENTERS IN THE UNITED STATES

	Atlanta	Baltimore	Boston	Buffalo	Chicago	Cincinnati	Cleveland	Denver	Detroit	Galveston	San Francisco	San Jose, Cal.	Indianapolis	Jacksonville, Fla.	Kansas City	Little Rock	Los Angeles	Los Angeles, Cal.	Madison, Wis.	Memphis	Minneapolis	Mobile	New Orleans	New York	Philadelphia	Pittsburg	Portland, Me.	Portland, Ore.	Saint Louis	St. Paul, Minn.	Seattle, Wash.	Wichita						
Atlanta	969	1104	988	731	461	705	1523	722	607	840	8165	548	381	884	553	2287	10820	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446						
Baltimore	696	416	402	802	805	474	1827	633	1591	1201	671	794	885	1211	1270	3014	1296	807	1222	801	1150	168	1292	97	326	311	654	355	3156	1770	3036	4057	40					
Boston	1104	416	478	999	805	601	2021	724	1979	1811	2706	844	1380	1823	1329	3235	11403	1807	1489	217	108	3236	1194	3036	3553	1770	3036	4057	442	458	442	458						
Buffalo	731	802	478	805	805	601	1832	724	1979	1811	2706	844	1380	1823	1329	3235	11403	1807	1489	217	108	3236	1194	3036	3553	1770	3036	4057	442	458	442	458						
Chicago	461	802	805	805	805	601	1832	724	1979	1811	2706	844	1380	1823	1329	3235	11403	1807	1489	217	108	3236	1194	3036	3553	1770	3036	4057	442	458	442	458						
Cincinnati	705	1523	722	607	840	8165	548	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446						
Cleveland	722	607	840	8165	548	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458					
Denver	1523	722	607	840	8165	548	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458				
Detroit	607	840	8165	548	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458				
Galveston	840	8165	548	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458			
San Francisco	548	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458		
San Jose, Cal.	8165	548	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	
Indianapolis	548	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458		
Jacksonville, Fla.	381	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	
Kansas City	884	553	2287	10820	1181	289	446	474	1020	1181	289	446	474	1020	1181	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458
Little Rock	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
Los Angeles	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458
Los Angeles, Cal.	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458
Madison, Wis.	289	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
Memphis	446	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458
Minneapolis	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
Mobile	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
New Orleans	474	1020	774	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
New York	802	805	805	805	805	601	1832	724	1979	1811	2706	844	1380	1823	1329	3235	11403	1807	1489	217	108	3236	1194	3036	3553	1770	3036	4057	442	458	442	458	442	458	442	458		
Omaha	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458
Philadelphia	1212	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458
Pittsburg	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
Portland, Me.	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
Portland, Ore.	2830	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
Saint Louis	607	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458		
St. Paul, Minn.	2984	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	
Seattle, Wash.	2762	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458
Wichita	1844	2602	4610	446	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	442	458	

The figures in this table are taken from the "official table of distances" used by the war department of the United States government, except the distances to cities marked (\*), which are computed along the best routes of travel. All distances are in statute miles.

## WORLD TRAVEL DISTANCES

The chief ports of the world are named in alphabetical order across the top and down the sides of the table. The distances between any two ports will be found at the intersection of the two columns which contain the names of the selected ports. Thus the distance from Baltimore to Bombay is given as 8,131, and the small "g" shows that the route is via Suez Canal. Distances are for full-powered steam vessels reckoned in nautical miles.

Amsterdam	Antwerp	Batavia	Bombay	Boston	Bremen	Buenos Ayres	Cape Town	Charlebourg	Cebu	Glacow	Hankow	Havana	Hart	Hongkong	Liverpool	London	Manila	New Orleans	New York	Panama	San Francisco	Shanghai	Singapore	Southampton	Valparaiso	Yokohama									
—	135	3577	723	6336	3194	273	6570	6185	303	8237	618	290	4335	297	8764	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298							
Antwerp	—	3441	697	6300	3128	387	6334	6157	267	2501	782	305	4299	251	8725	675	190	10866	4801	3210	849	3344	13641	10471	8298	333	8633	11196							
Batavia	3577	—	3688	5098	6913	337	4332	3330	3969	1141	674	3381	5098	337	11659	3328	3328	13760	1614	4126	2266	4609	13167	12693	8397	13377	13666	13089							
Bombay	723	6336	—	2437	8199	1890	4090	4169	3394	5596	4130	3716	4108	1472	3653	11627	3624	3861	11647	2115	1035	3469	10779	11438	10777	3323	8666	13089							
Boston	3194	273	6336	—	6345	2730	880	6271	6089	448	2146	113	691	3899	828	8673	137	683	10640	4401	2912	390	3188	13825	10633	633	468	8732	11135						
Bremen	3128	387	5098	6913	—	3265	7876	707	3459	3175	2967	3771	2965	3477	1141	1033	11627	2948	3172	11973	1643	999	3873	4085	12444	12764	8934	2556	7678	13094					
Buenos Ayres	6570	4169	4090	4130	3265	—	7962	6549	6549	4604	4900	4473	6267	6267	8000	6113	4090	6223	6305	8602	8153	3997	7524	9790	10446	2450	6090	9673	5332						
Cape Town	6185	3716	4108	3716	3128	4169	—	3377	3564	3777	3396	1422	3946	11390	2854	3008	13354	1924	2791	4714	13073	12123	10960	2909	8503	12532		479	963	1189					
Charlebourg	303	8237	618	290	4335	297	8764	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	6124	277	12110				
Cebu	618	290	4335	290	4335	297	8764	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	479	963	1189				
Glacow	618	290	4335	290	4335	297	8764	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	479	963	1189				
Hankow	290	4335	290	4335	290	4335	297	8764	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	479	963	1189			
Havana	4335	290	4335	290	4335	297	8764	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	479	963	1189				
Hart	297	8764	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	479	963	1189				
Hongkong	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	479	963	1189	6124	277	12110			
Liverpool	711	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	479	963	1189	6124	277	12110			
London	301	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	479	963	1189	6124	277	12110				
Manila	11133	4837	3546	885	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189			
New Orleans	4837	3546	885	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189				
New York	3546	885	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189	6124	277	12110		
Panama	885	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189	6124	277	12110			
San Francisco	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189			
Shanghai	10007	8234	377	8409	11298	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189	6124	277	12110	
Singapore	8234	377	8409	11298	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189	6124	277	12110		
Southampton	377	8409	11298	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189	6124	277	12110			
Valparaiso	8409	11298	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189	6124	277	12110	6124	277	12110	
Yokohama	11298	10007	8234	377	8409	11298	10007	8234	377	8409	11298	10007	8234	377	8409	11298	845	3290	13639	10007	8234	377	8409	11298	10007	8234	377	8409	11298	479	963	1189	6124	277	12110

S. via Kiel canal.

S. via Suez canal.

S. via Cape of Good Hope.

S. via Strait of Magellan.

S. via Cape Horn.

S. via Torres Strait.

## WORLD TRAVEL DISTANCES—Continued

The chief ports of the world are named in alphabetical order across the top and down the sides of the table. The distance between any two ports is found at intersection of the two columns which contain the names of the selected ports. Thus the distance from New York to Melbourne is given as 11,060. The small "c" shows that the route is via Cape of Good Hope. Distances are for full-powered steam vessels reckoned in nautical miles.

	Amsterdam.	Antwerp.	Batavia.	Bombay.	Boston.	Bremen.	Buenos Ayres.	Cape Town.	Cherbourg.	Colon.	Chongking.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.	Hankow.
Amsterdam.	711	675	3624	127	6223	2534	924	6355	6076	437	2124	310	943	4023	503	9651	—	538	1135	4225	8056	345	5158	1247	10294	8211	445	517	1113
Antwerp.	201	180	3861	665	6590	3506	409	6294	5117	277	2181	745	427	4264	194	9668	—	11005	4761	3270	306	5204	13553	10467	8248	201	4793	11150	
Batavia.	9967	9631	11320	9576	17385	10636	6801	9271	7694	9668	9668	12328	9440	404	9641	6511	12627	11864	9238	10251	9238	10251	1435	1435	9421	10406	1768		
Bombay.	11131	11005	11047	11049	6355	13254	11344	9099	5814	10835	9248	11122	11349	12313	11904	5021	11165	—	12140	10779	9237	6966	5254	3533	10683	6280	4575		
Boston.	3217	3231	3245	3441	1222	3330	6421	7108	3904	3441	3603	3448	3475	3133	11019	3190	3241	12806	3677	1451	2944	3281	13496	12313	10129	10683	6280	4575	
Bremen.	4687	4691	3115	4401	16025	1294	6260	6355	7247	4331	5397	4447	5068	567	4652	12654	4335	4761	12140	—	1699	4464	8160	13254	12667	11654	4635	4754	14506
Buenos Ayres.	2514	2478	1099	2692	5907	480	3777	5774	6799	3233	4398	3168	3745	868	3399	17735	3304	2438	15776	1490	396	3141	4599	13643	10759	3259	5273	12526	
Cape Town.	2246	2310	1825	2912	6182	279	3549	5935	6946	2965	4094	3669	3877	1227	3131	11880	3053	2279	11886	1699	2975	4740	13107	12224	10141	3981	8237	12562	
Cherbourg.	11282	11247	6152	11274	12366	10617	11856	7961	11087	11143	11353	11214	10682	11156	8354	11761	11267	7949	12569	10683	11643	6158	3277	8672	13406	11127	2615	7702	
Colon.	4215	4192	1142	4056	8262	3942	4442	3253	4230	3935	4193	4135	4440	377	4010	12554	4943	4183	10520	3136	2915	3893	2748	10264	15947	10250	3983	5754	12666
Chongking.	2462	2446	1828	3048	5284	517	3664	5670	6961	3201	4156	3694	3712	1185	3267	17173	3173	2408	13682	1660	224	3109	4762	13141	12465	10275	3227	8271	13174
Hankow.	335	340	3594	360	5997	2791	598	6029	5832	106	1896	442	618	3982	175	9455	345	309	10792	4464	2973	—	4899	13200	10168	7568	129	5330	10687
Hankow.	2608	2600	1927	2682	7913	96	2399	4848	6737	3505	3507	3317	1479	3671	12254	2776	2710	12570	1972	427	2713	4796	13118	12077	9694	3631	5348	12796	
Hankow.	5295	5244	3079	5188	7284	4714	5501	1125	2268	4984	5260	5518	4679	5621	118	5158	5264	3827	5190	4748	4033	—	614	18051	8631	5054	44	11680	
Hankow.	1075	1015	4410	3368	8246	1515	4039	4629	5709	3370	4188	1866	580	5846	1275	10753	1718	1207	12412	8848	4284	1336	8239	16650	11813	9237	3631	7126	12149
Hankow.	2848	2810	4410	3368	8246	1515	4039	4629	5709	3370	4188	1866	580	5846	1275	10753	1718	1207	12412	8848	4284	1336	8239	16650	11813	9237	3631	7126	12149
Hankow.	12507	12503	11128	11237	9790	12673	13822	7938	10217	12345	12399	12679	12974	12413	9341	12317	12585	9696	13824	12107	12300	9414	—	—	—	—	—	—	
Hankow.	2916	2850	1646	3443	5640	598	4139	4620	4694	5773	3853	4292	3661	4008	614	3753	3853	17720	3468	3791	11644	1156	1428	3494	3064	1012	7130	13102	
Hankow.	3967	3931	1642	3443	5640	598	4139	4620	4694	5773	3853	4292	3661	4008	614	3753	3853	17720	3468	3791	11644	1156	1428	3494	3064	1012	7130	13102	
Hankow.	14415	14362	12317	14306	9415	12313	10096	8721	10096	1412	13309	11826	1464	12714	8191	8779	14542	7236	12525	12825	12825	12825	12825	12825	12825	12825	12825	12825	
Hankow.	10207	10041	12370	10041	12370	11380	10041	10011	8644	10408	10738	12166	10380	8453	10094	10437	8234	15647	12224	10166	10681	9491	—	—	—	—	—	—	
Hankow.	8524	8586	10187	8523	9450	9660	8537	8676	9631	8026	8461	8315	8553	10982	8697	1440	8911	8248	3835	13444	10181	7963	8651	7963	2183	—	—	—	
Hankow.	277	238	3623	458	6990	3909	479	6154	5947	55	1991	370	497	4005	105	9518	445	301	10855	4329	3091	129	5024	12595	10251	8673	—	—	
Hankow.	3278	3240	3299	3265	3900	3504	3154	3239	3980	3513	3267	3607	6994	3187	6398	3080	7335	6936	8195	3097	8179	12378	9178	12378	9178	12378	9178	12378	
Hankow.	6699	6623	6755	6755	8206	6652	2766	8447	8775	8035	8659	9100	3168	9642	10346	8747	3798	6398	6754	8237	8237	8237	8237	8237	8237	8237	8237	8237	
Hankow.	11298	11190	10869	11135	5335	12353	11439	12165	8549	10890	8863	11217	11467	13390	10999	13460	11113	11169	4375	10566	10867	11560	4521	10902	10860	8339	—	—	

a, via Kiel canal.

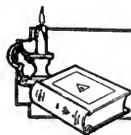
b, via Suez canal.

c, via Cape Town.

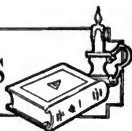
d, via Strait of Magellan.

e, via Cape Horn.

f, via Torres Strait.



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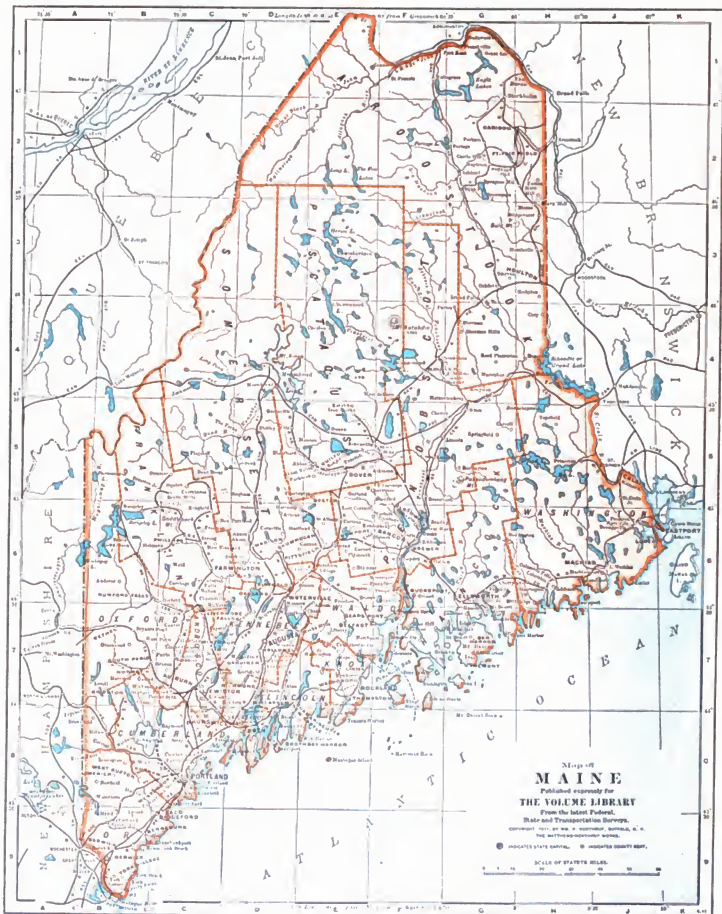
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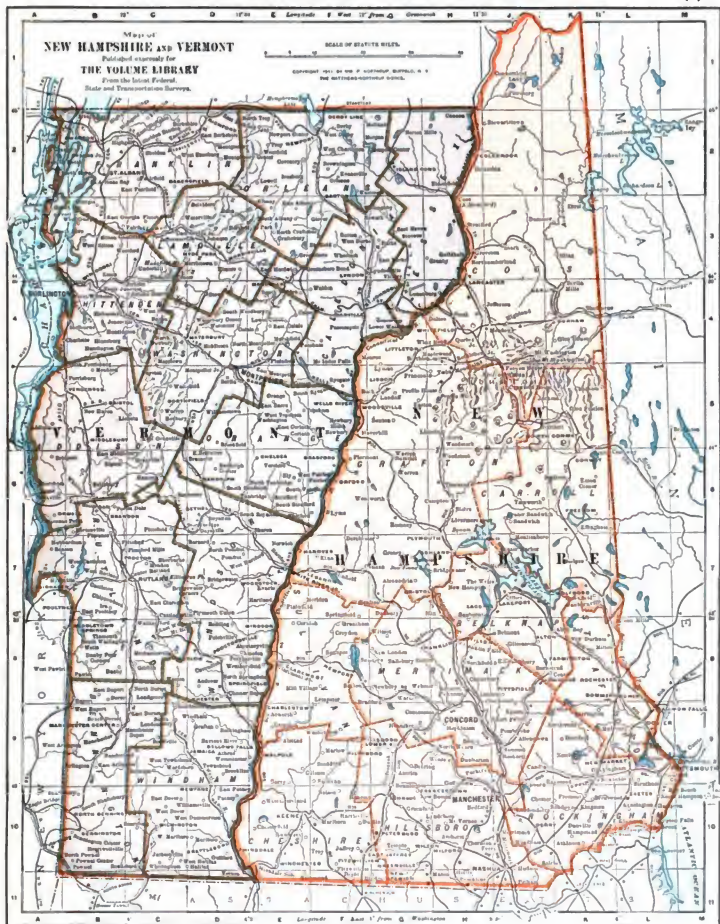
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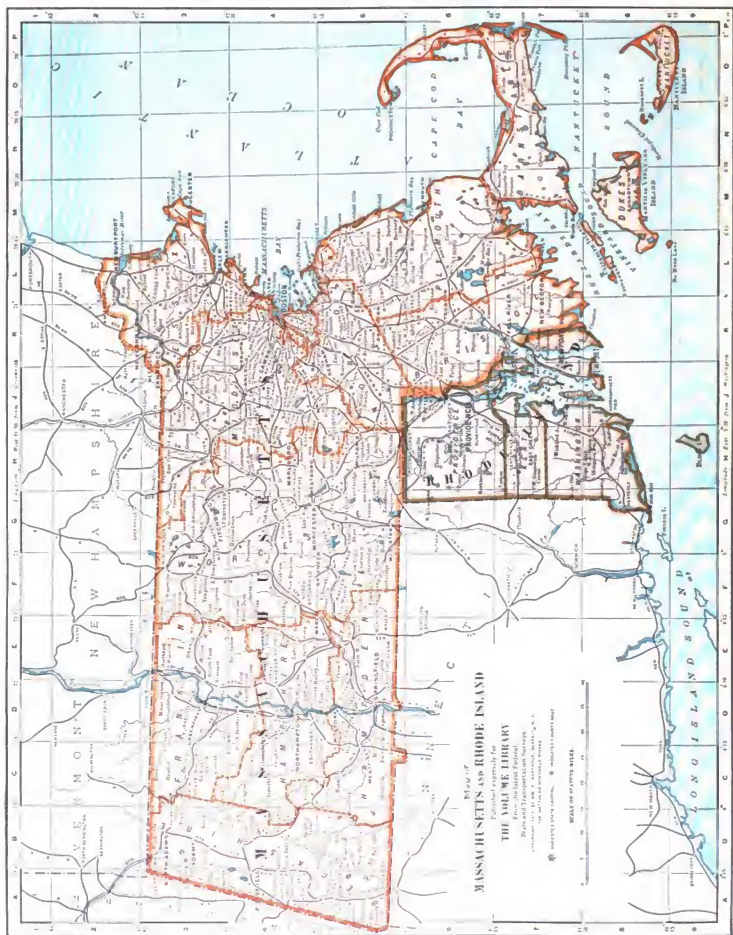


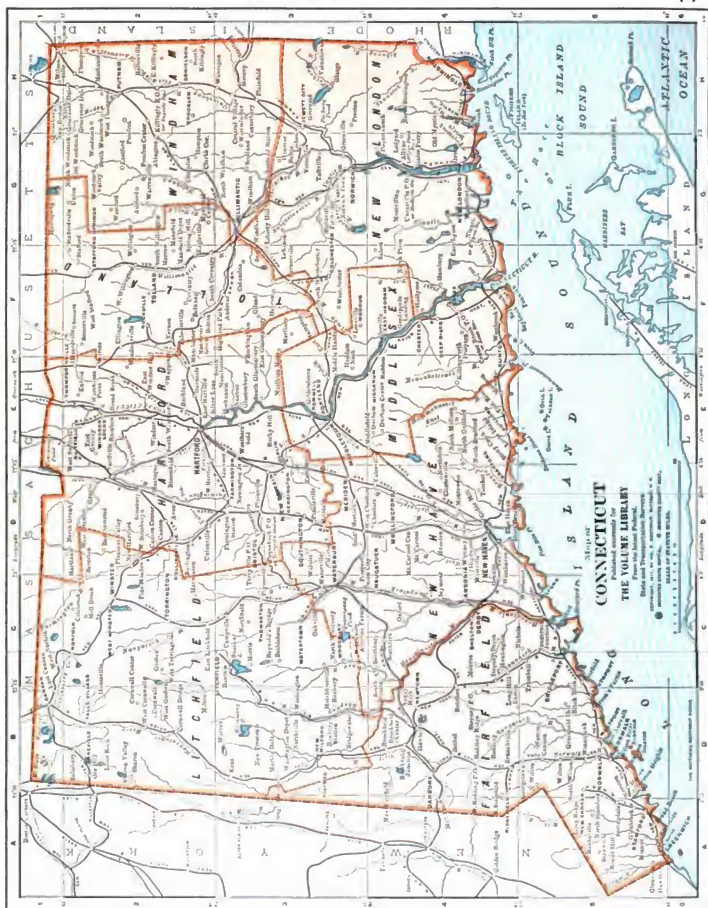


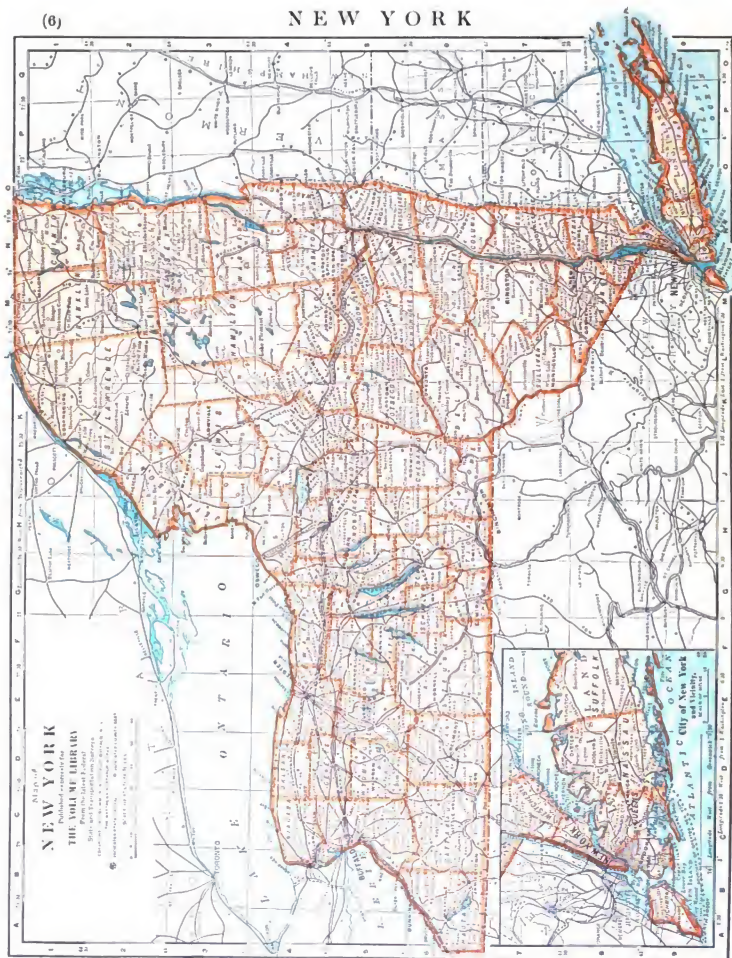




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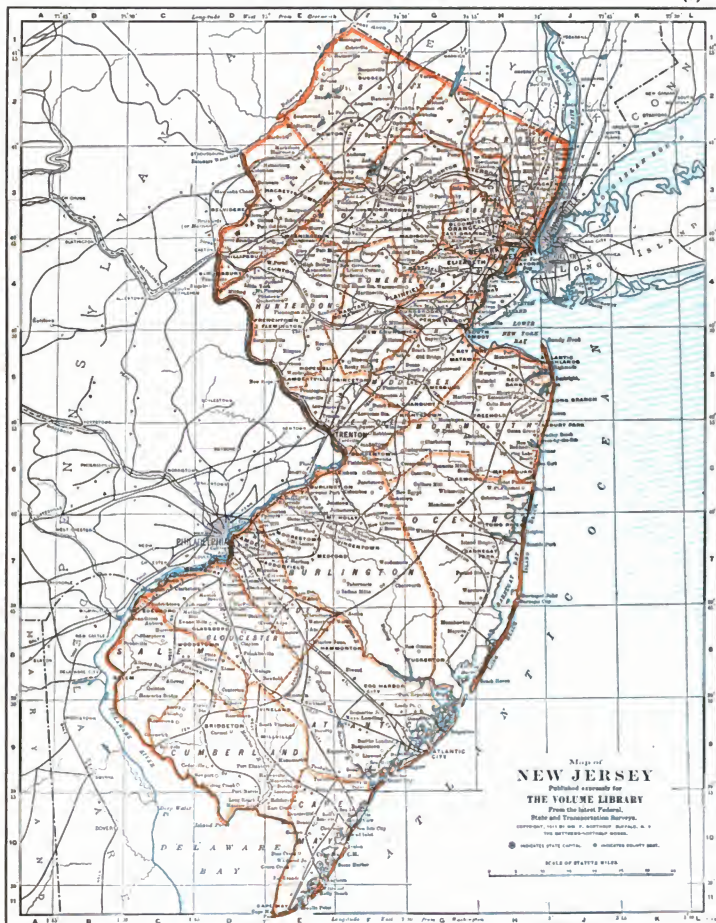




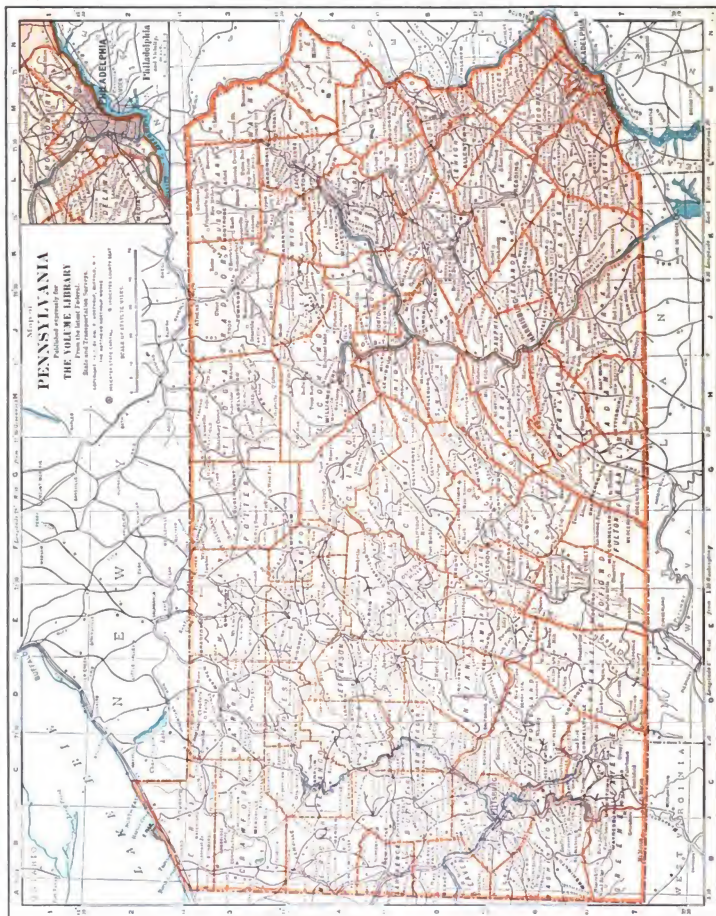


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(7)



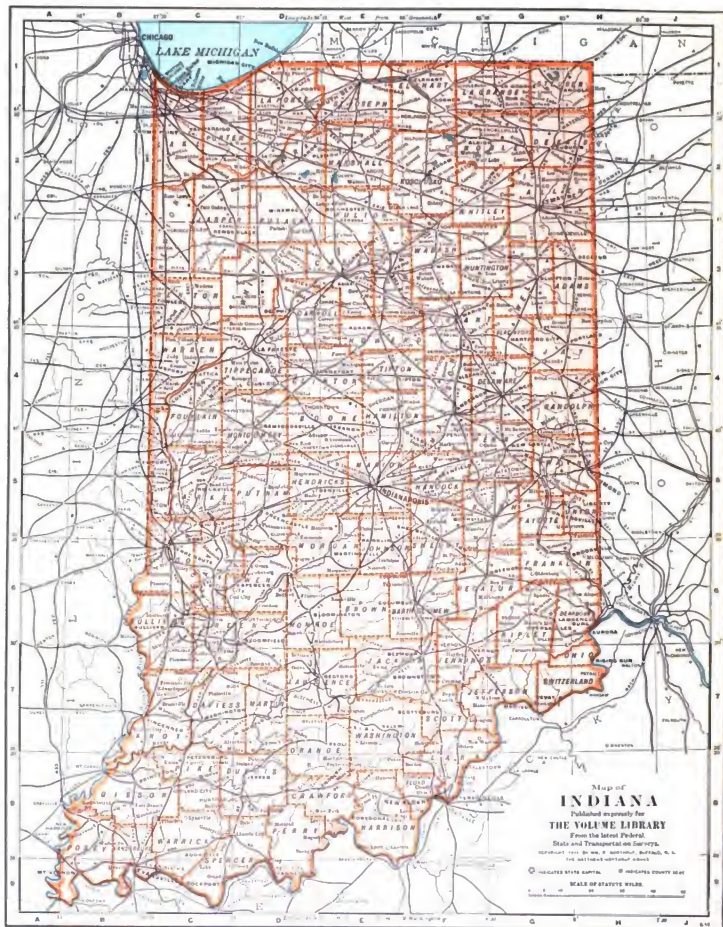
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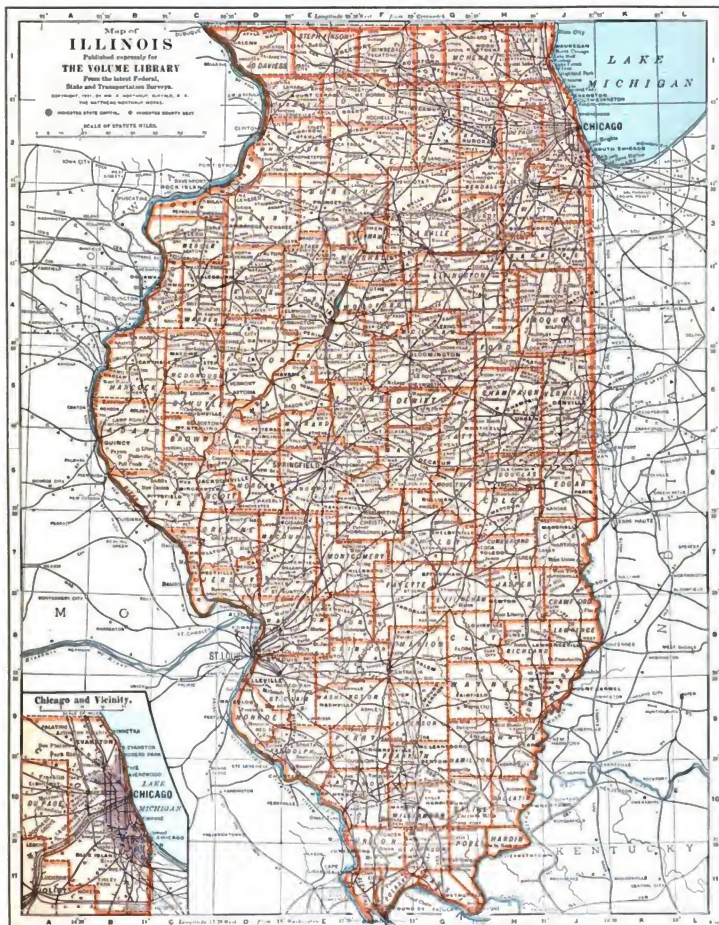






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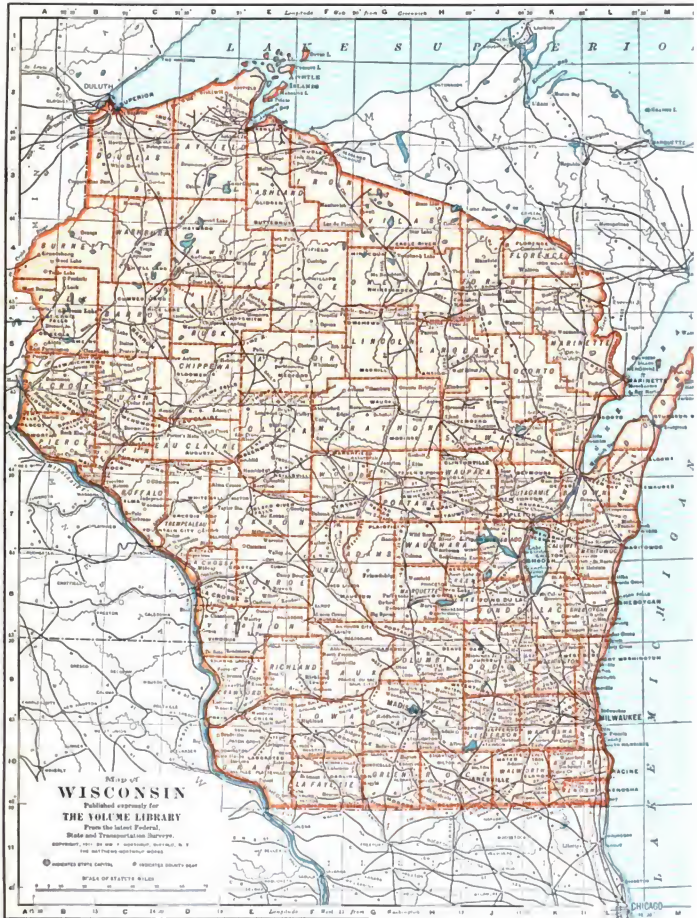


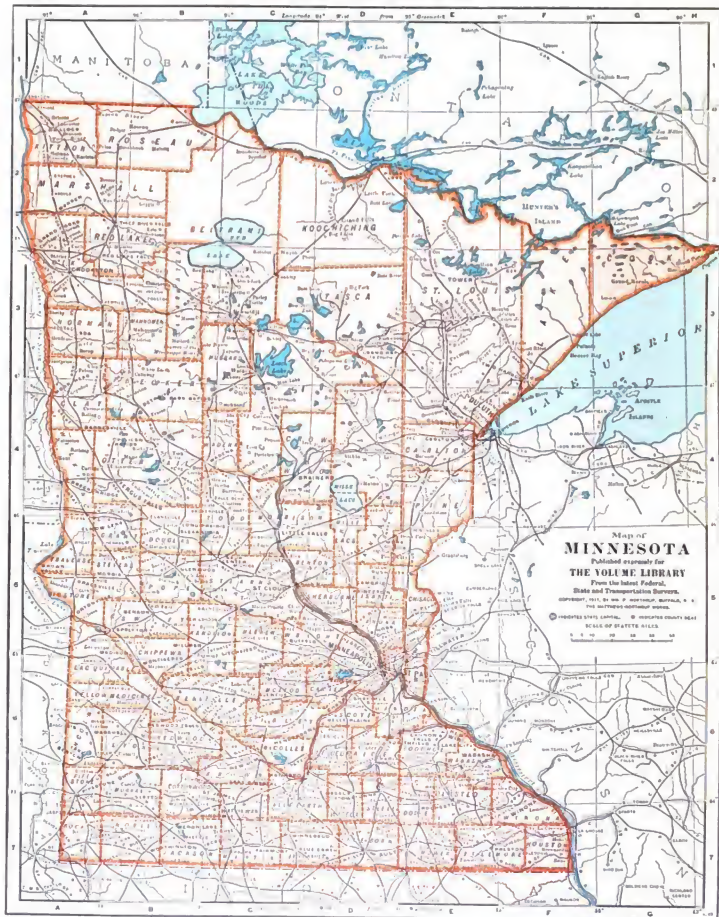




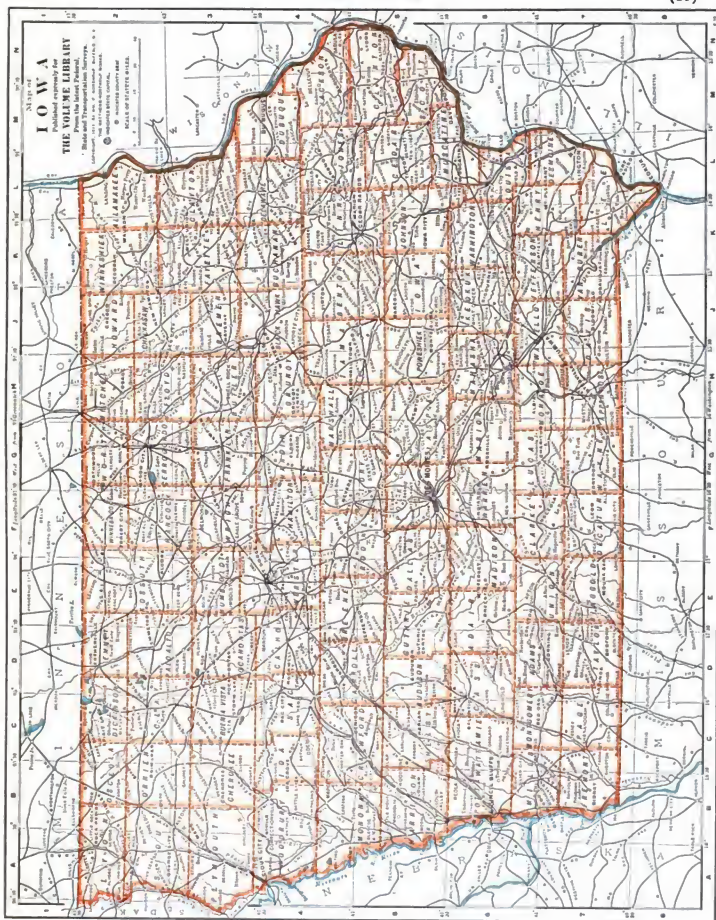
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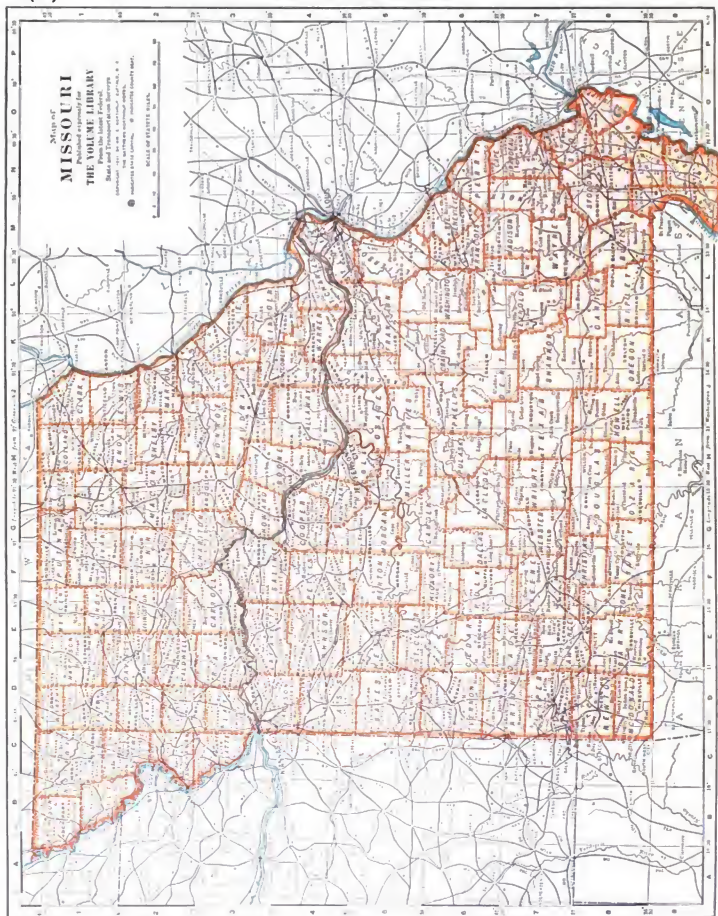
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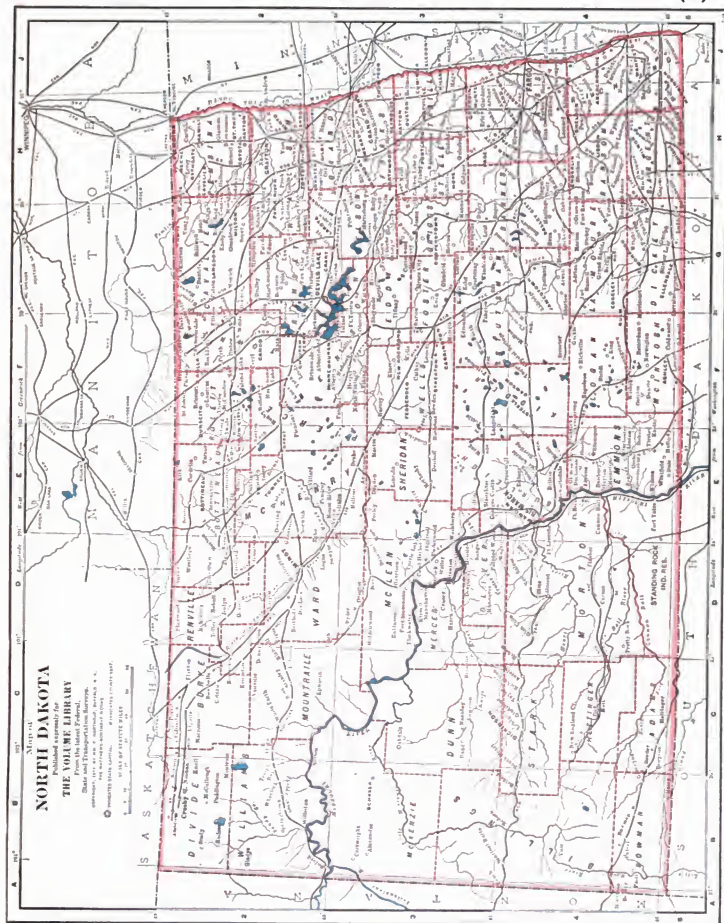












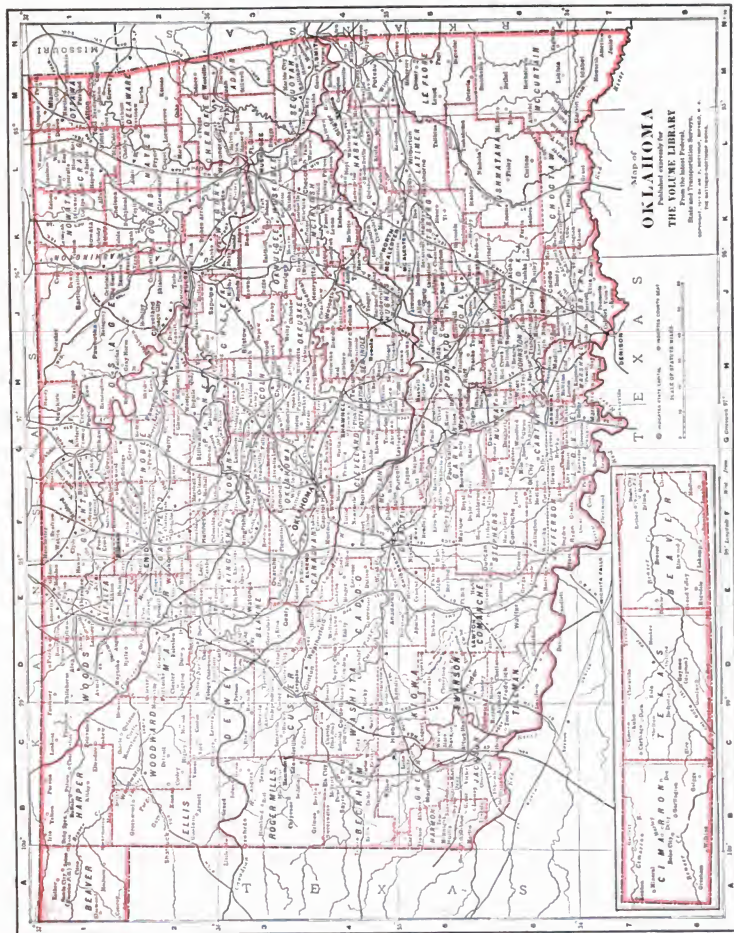


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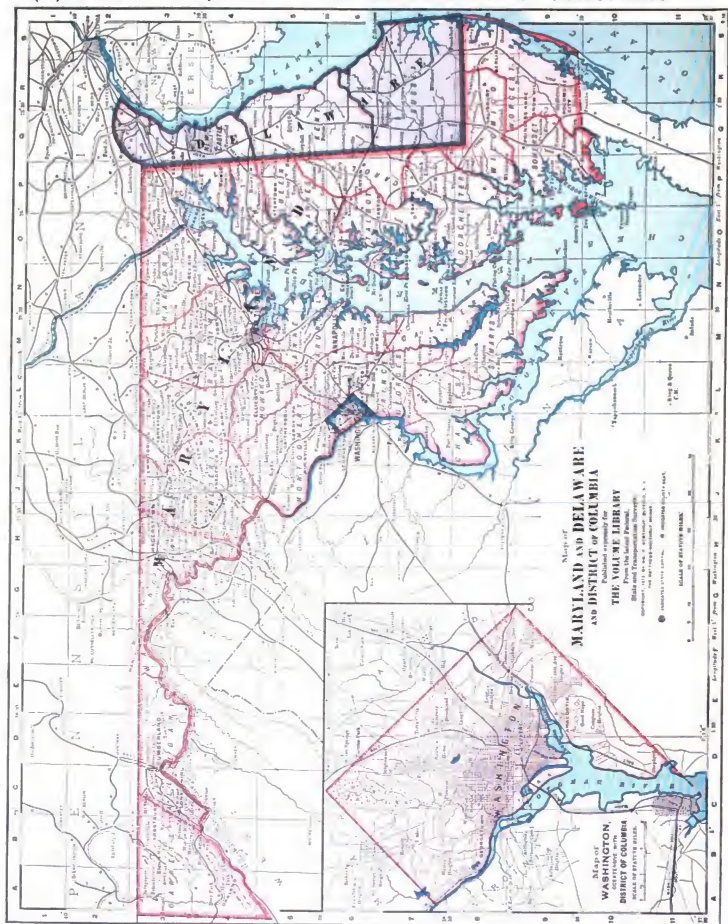




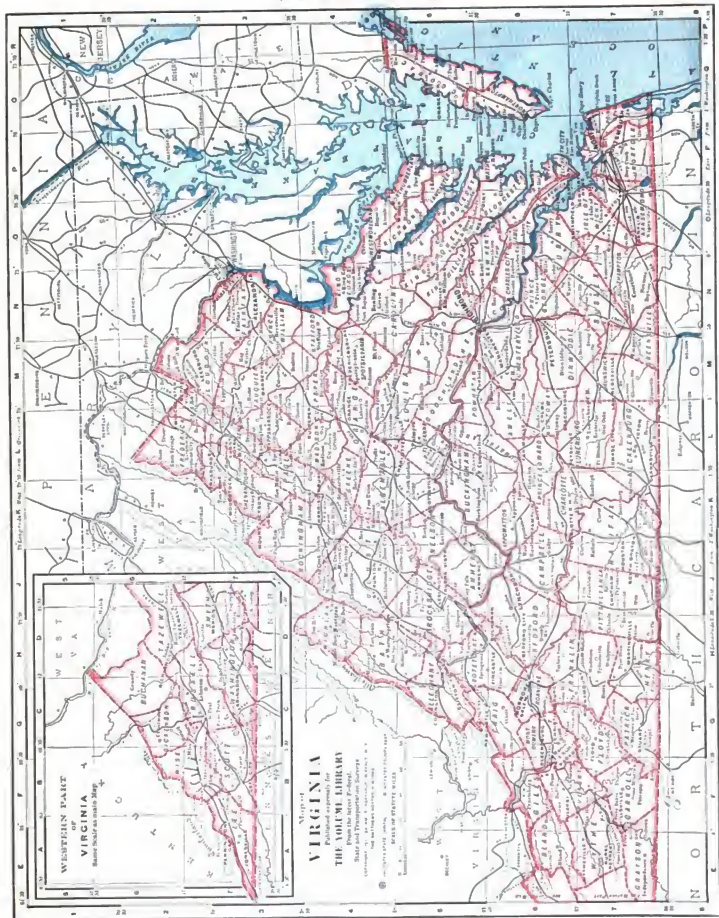


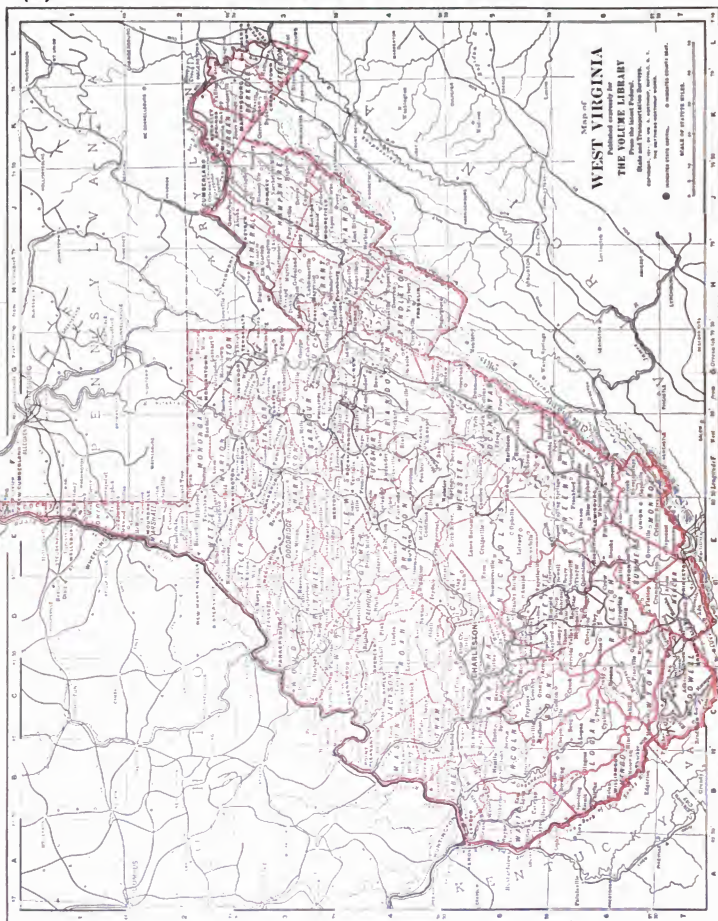


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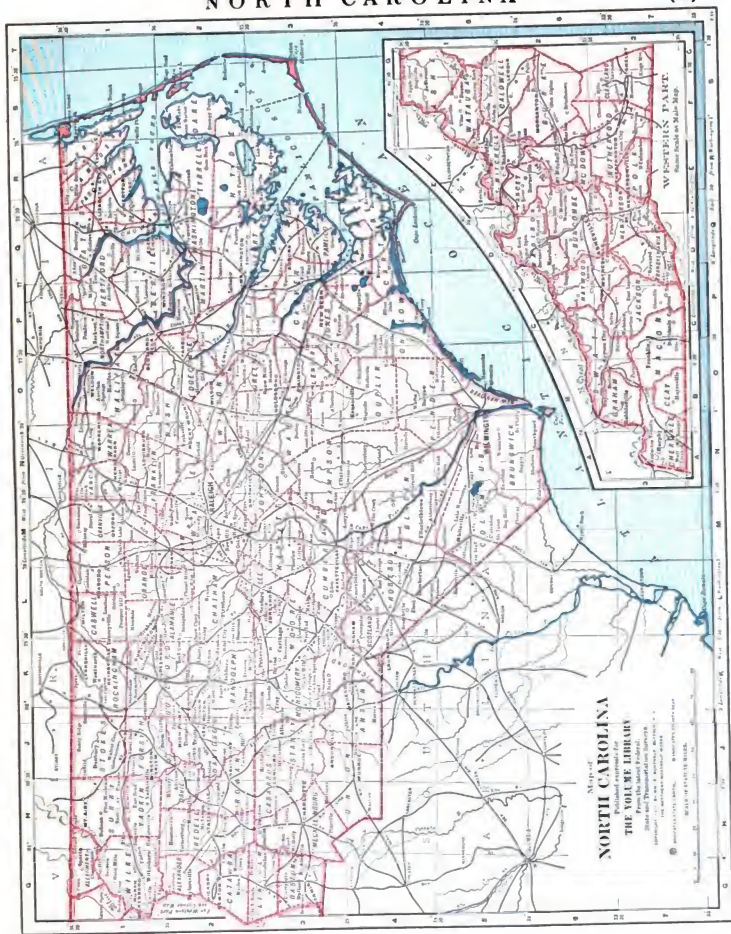


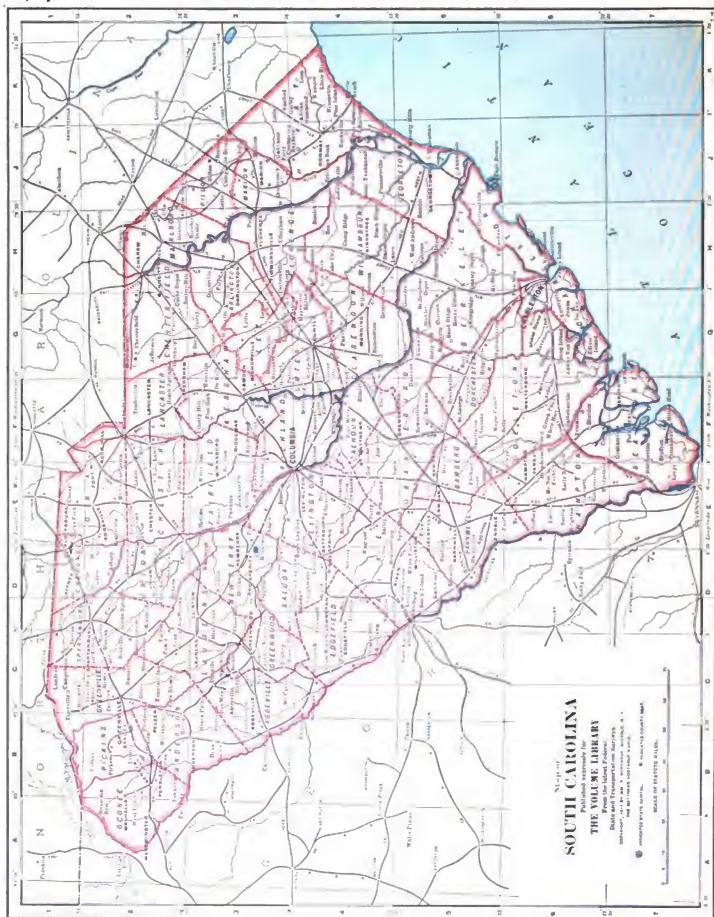


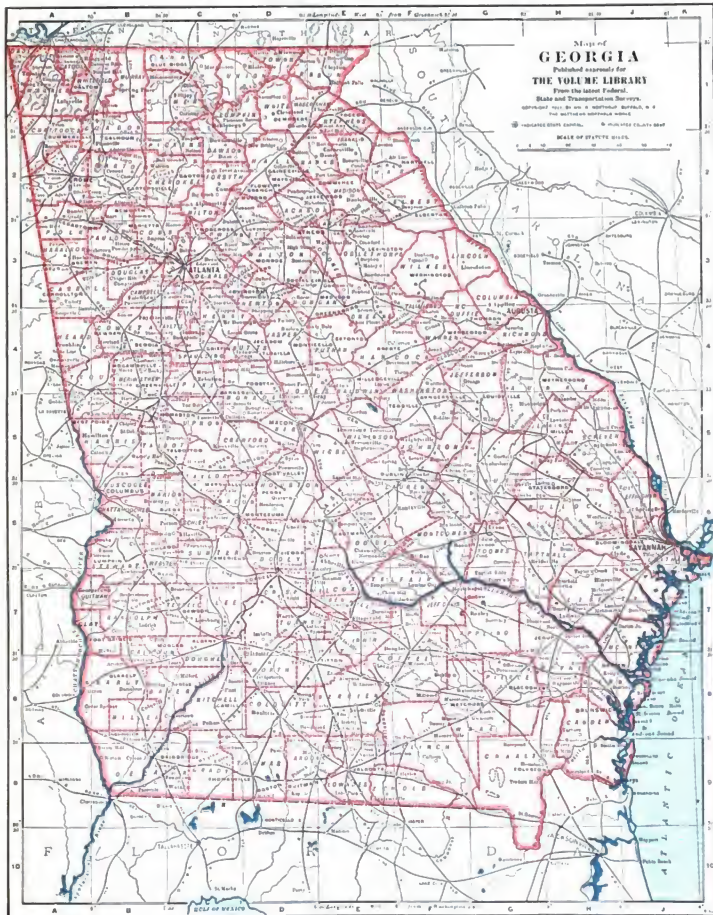














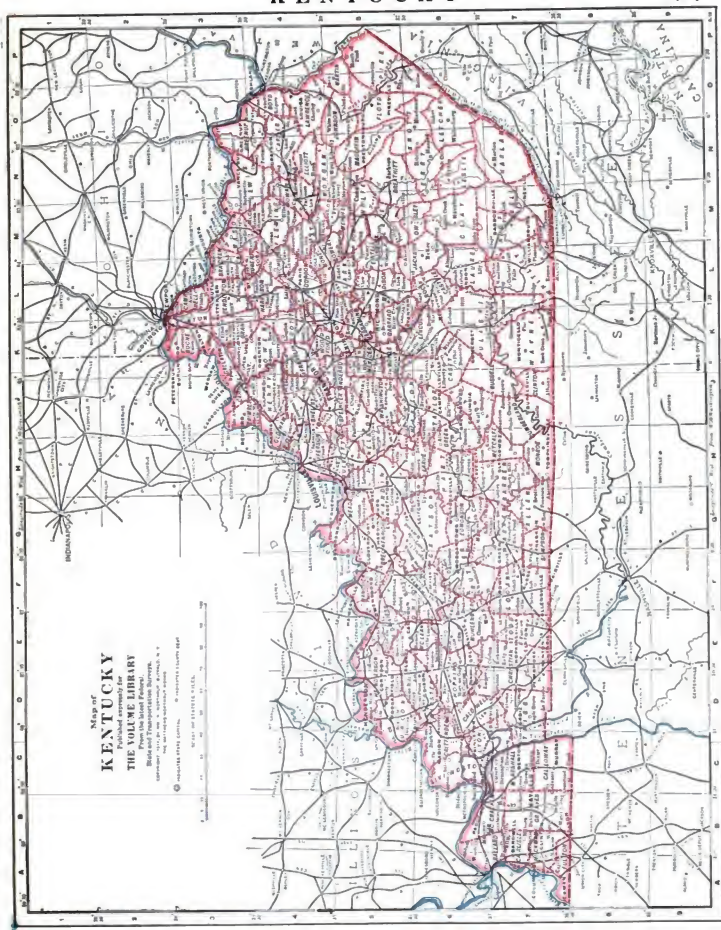
## FLORIDA

Map of  
**FLORIDA**  
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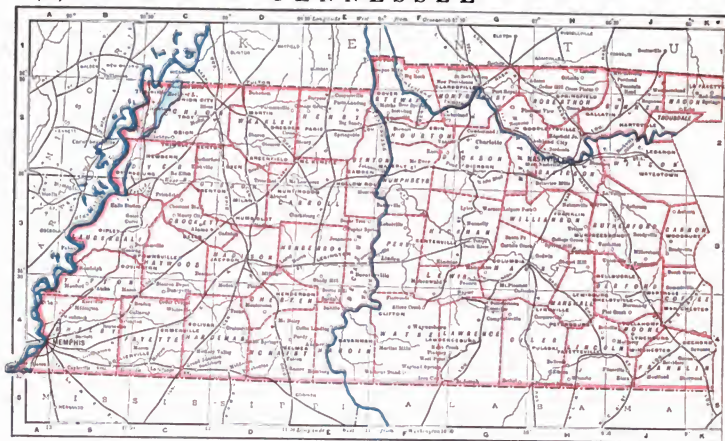
Copyright, 1915 by Geo. A. Hartman, Publisher, N. Y.  
THE HARTMAN MAPS COMPANY  
INDICATES DRIVE ROUTES. INDICATES 1 MILE SCALE.

SCALE OF STATUTE MILES  
0 10 20 30 40 50 60 70 80 90 100

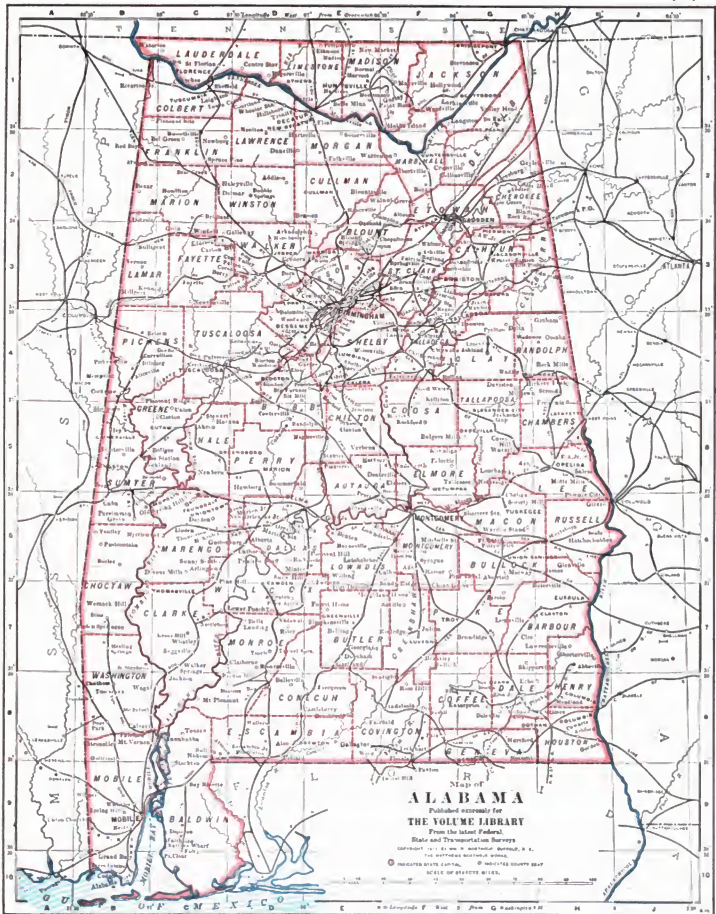
WESTERN PART  
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Same Scale as main Map.



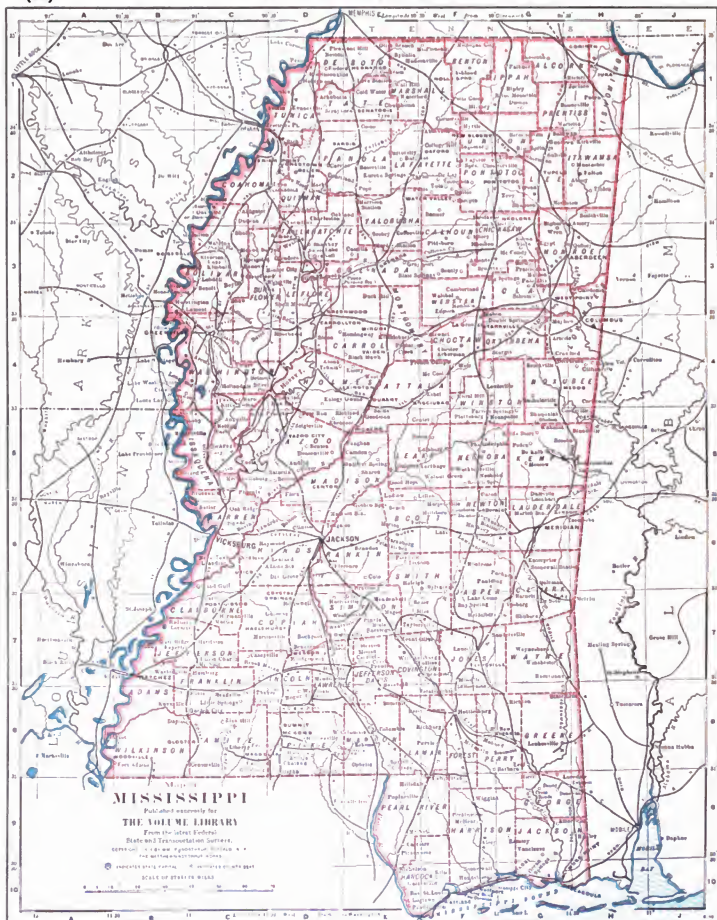
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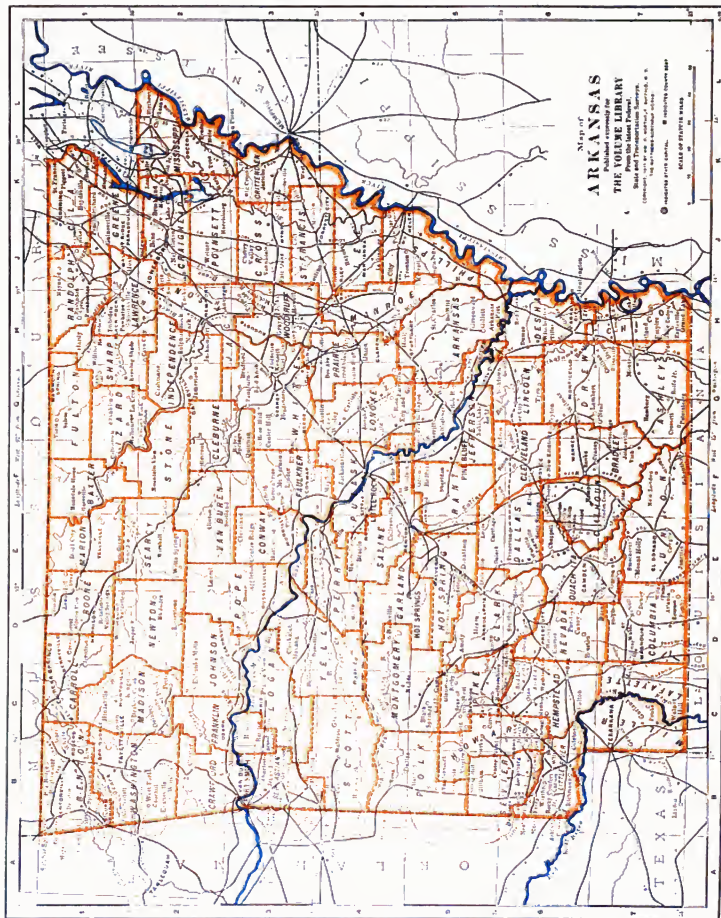


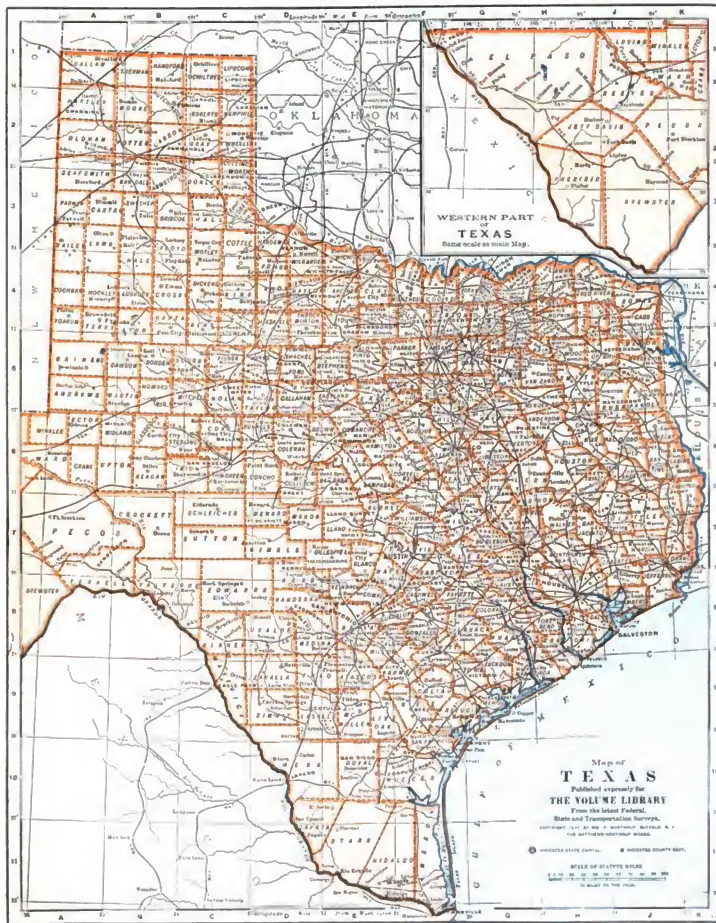
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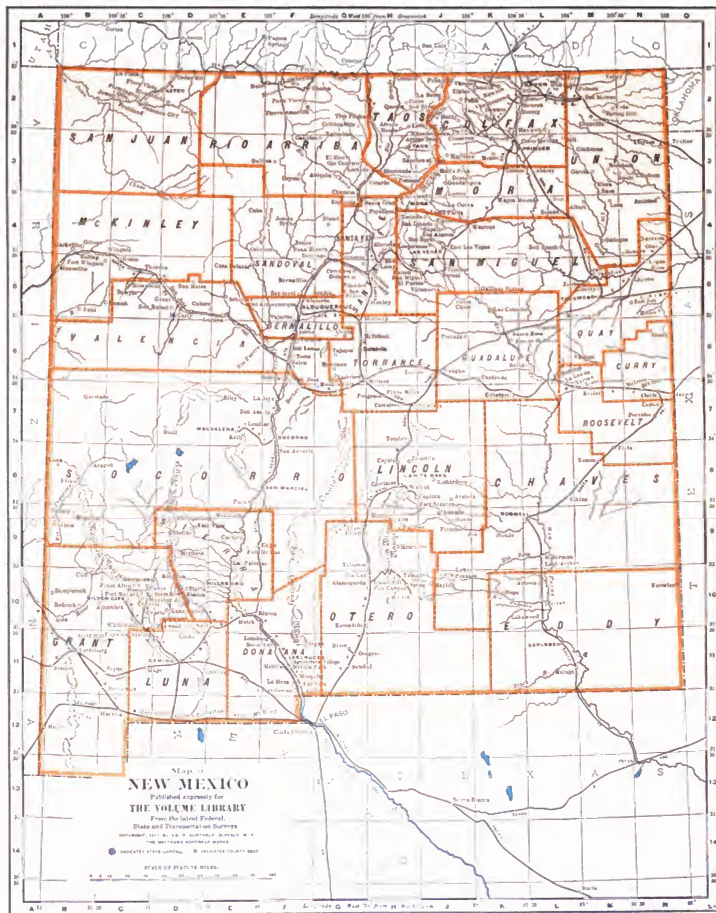








## NEW MEXICO



(37)









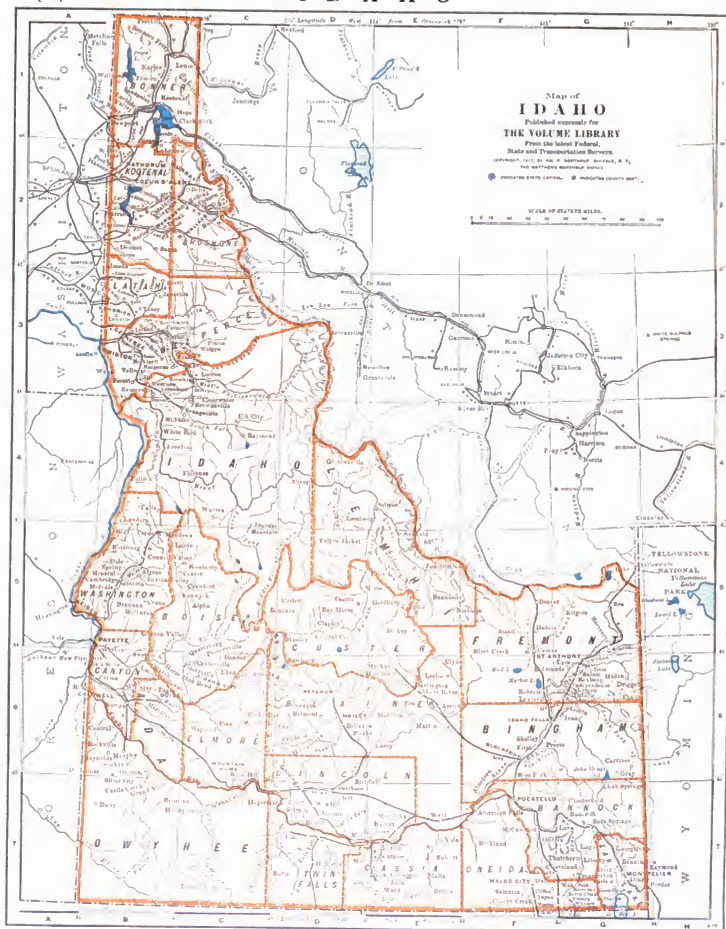




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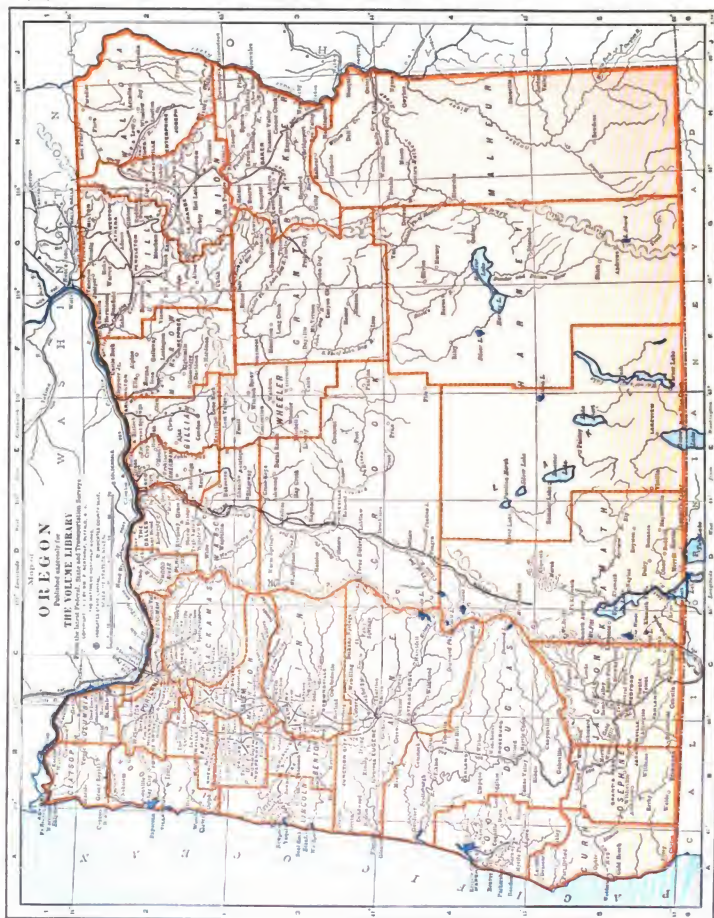
I D A H O

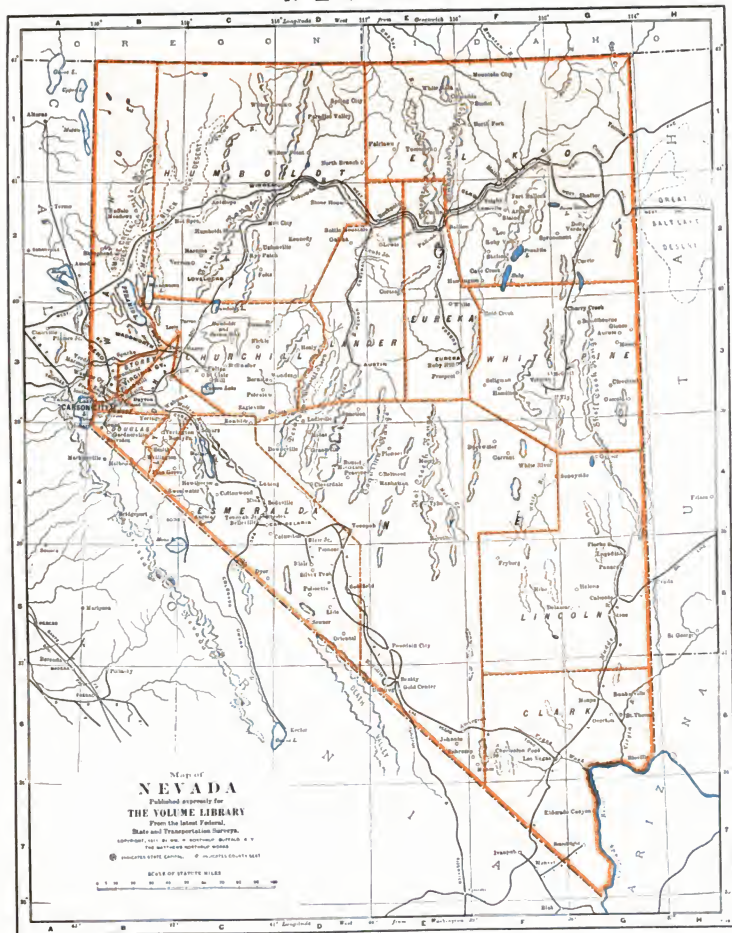


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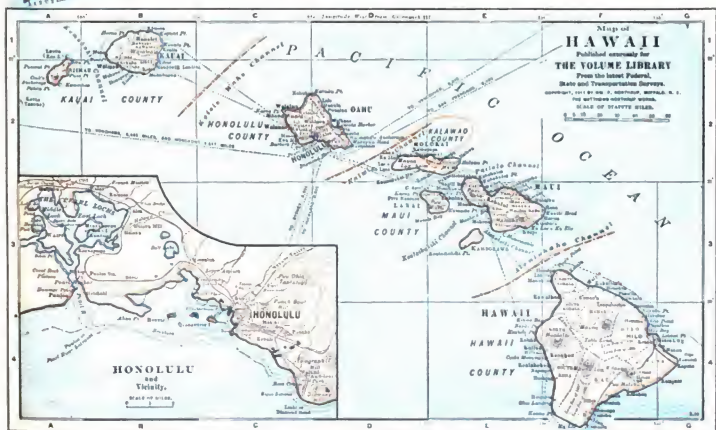






## CALIFORNIA



















Vermont, 1866-71; president University of Michigan, 1871-1909; member Anglo-American International Commission on American Fisheries, 1887; chairman Canadian-American Commission on Deep Waterways from Lakes to Sea, 1896; appointed minister to Mexico, 1897; died May 1898. President, University of Michigan, 1898-1909. Author: *Progress in International Law* (1898); *The Fisher* (1900-07).

**Angelo** (an-jé'lo), **Michael de Buonarroti**. See **Michelangelo**.

**Anglo** (an-jé'lo), **Margaret Mary actress**, was born at Ottawa, Canada, 1876; educated at Loretto Abbey, Toronto, and convent of the Sacred Heart, Montreal, 1894; made her debut at Grandstand, New York, 1901; leading woman with *Le Héros*, 1901-02; *River of the Gods*, 1902-03; and in Empire Theatre Stock Co.; starred in *Sue*, 1903-06; with Henry Miller, in *The Great Divide*, 1906-07.

**Angouleme** (an-jé'lon), **Louis Antoine de Bourbon**, duc d'Angoulême son of Charles X. of France, was born at Versailles, France, 1775. In 1799 he married his cousin, Marie Thérèse, only daughter of Louis XVI., "the only man in the family," in the words of Napoleon. After the Restoration he made a feeble effort, as lieutenant-general of France, to oppose Napoleon on his return from Elba. During the revolution of 1830 he accompanied his father into exile, and died at Gora in 1844.

**Anna Comnena** (kom-né'na), a learned Byzantine princess, author of one of the most valuable works to be found in the collection of the Byzantine historians, was the daughter of the emperor Alexander I. (Comnenus), born 1083. She framed a conspiracy against the life of her brother then as Emperor in 1118. Her father spared her life, but punished her by confiscation of her property, which, however, he soon after generously restored. Disappointed and grieved, she withdrew from the court and sought refuge in literature. Died 1144.

**Anna of Austria** (an-jé'la), **Philip II. of Spain**, was born at Madrid in 1601, and in 1615 became the wife of Louis XIII. of France. On the death of the king, in 1643, she became queen-regent, and availed her discernment by choosing as her minister Cardinal Mazarin, by whose able management the young king Louis XIV. was reared, and by his majority, into possession of a throne firmly established on the ruins of contending parties. Died in 1666.

**Anne de Beaujeu**, daughter of Louis XI., was born about 1462; married Peter Beaujeu, duke of Bourbon, and, constant, and powerful, she attained as regent of the kingdom during the minority of her brother, Charles VIII. Died in 1522.

**Anne de Brittany**, daughter of Duke of Duke Francis II., was born at Nantes, France, in 1476. In 1491 she was united to Charles VIII., king of France, and governed France as regent during the expedition of that prince to Italy. After his death she married Louis XII. in 1499, over whom she exercised great influence, and died at Blois in 1514.

**Anne of Cleves**, the fourth wife of Henry VIII., to whom she was married in 1540, was born at Cleves, Germany, 1515. She was the daughter of John, third duke of Cleves. The match was projected by Cromwell, and was partly the cause of that minister's ruin. Henry put her aside, settled on her a liberal annuity, with which she was well satisfied, and she spent the remainder of her days in England, where she died in 1557.

**Anne, Queen of England**, was the second daughter of King James II. by his first wife, Anne Hyde, and was born in London, England, in 1664. Anne ascended the throne on March 8, 1702. During her reign, which was made illustrious by her early triumphs of the duke of Marlborough, Sir George Rooke and Sir Cloudesley Shovel conquered the fortress of Gibraltar, and in which Spain has never been able to regain; and the legislative union of Scotland with England was effected. The glorious galaxy of writers, in which every branch of learning, who flourished in her time, has caused it to be considered the Augustan age of British literature. She died in 1717.

**Annonato** (an-nó'na'tó), **Gabriele d'**. See **D'Annunzio, Gabriele**.

**Anselm of Canterbury**, a scholastic philosopher, was born at Aosta, Italy, about 1033. He was attracted by the reputation of Lafrane, he went in 1060 to study at the monastery of Bee, in Normandy. There he remained until 1063, when he was elected abbot of the monastery, the most famous school of the eleventh century. Lafrane, who in 1063 had been elected abbot of the monastery, died in 1093, and in 1093 Anselm was appointed.

**Anselm of Wilton**, an English jurist, was born at Wilton, Sussex, 1843; M. P. for Oxford University since 1899; trustee of the National Gallery, London, 1899; rector of the diocese of Oxford since 1899; warden of All Souls' College, Oxford, since 1891. He was educated at Eton and Balliol, Oxford, and was a member of All Souls', 1867; vice-chancellor of the University of Oxford, 1886-90; parliamentary secretary to the board of education, 1890-91; author of *Principles of the English Law of Contract, Law and Custom of the Constitution*.

**Anthony of Padua**, St., born at Lisbon 1195, was at first an Augustinian monk, but in 1220 he joined the Franciscan order, and became one of the most active propagators. He was canonized by Gregory IX. in the following year. According to tradition, he preached and fishes on the coast used to hear him; hence he is the patron of the lower animals, and is often represented as accompanied by a dog.

**Antony the Great**, St., the founder of monastic institutions, was born 251 near Alexandria, Egypt. In 267, having sold all his property, and given the proceeds to the poor, he withdrew into the desert, and within a number of years he had acquired the reputation of sanctity, and thus was formed the first order of monks. Died 356. **Antony** (an-tó'ny), **Alexander the Great**, a distinguished general of Alexander the Great, on whose death he became governor of Phrygia, Lycia, and Pamphylia, and after defeating and slaying Eumenes, and waging other successful wars, assumed the title of king. His ambitious schemes united his rivals, and he was slain in battle of Ipsus, Died 301 B. C.

**Antiochus** (an-tó'chú), III., surnamed **the Great**, was born about 238 B. C. He was the father, Seleucus Callinicus, as king of Syria in 223 B. C., and was the most distinguished of the Seleucids. He became involved in war with the Romans, who had conquered Macedonia; but declined to invade Italy at the instigation of Hannibal, who had come to him for refuge. He refused, and he was slain only on condition of his yielding all his dominions east of Mount Taurus, and paying a heavy tribute. He was afterwards defeated by the Romans at the battle of Elymais, when the people rose against him, and killed him in 187 B. C.

**Antiochus Epiphanes**, became king of Syria in 175 B. C. He fought against Egypt and conquered a great part of it. He twice took Jerusalem, and endeavoring to establish the worship of Greek gods, excited the Jews to a successful insurrection under Matthias and his allies, the Maccabees.

**Antipater** (an-típ'á'tér), Of the many persons who bore this name in antiquity the most celebrated was one of the generals of Alexander of Macedon, born about 400 B. C. When Alexander led his troops into Asia he left Antipater with Parmenio to guard the rear, and to dissuade him from the expedition, as governor of Macedon. He died 319 B. C.

**Antisthenes** (an-tíst'hen-és), father of Herod the Great; took part in the disputes between Hyrcanus II. and Aristobolus II. He assisted in placing Hyrcanus on the throne of Judaea, and afterwards strived to get the power in his own hands. He was afterwards appointed Procurator of all Judaea.

**Antoinette** (an-tó'net), **Marie**. See **Marie Antoinette, Josephine**.

**Antonicino** (an-tón'icé-no), **Cardinal Giacomo**, Roman prelate and statesman, was born in Italy in 1800, and died at Rome in 1876. He was raised to the rank of cardinal in 1847, and became secretary of foreign affairs for the papal states.

**Antonine** (an-tón'ín-é), **Marcus Aurelius**. See **Marcus Aurelius Antoninus**.

**Antoninus Pius** (Tito Aurelius Fulvius), Roman emperor, was born 86 A. D. In 120 he was made consul; afterward was sent by Hadrian as procurator into Asia, where the wisdom and gentleness of his rule won for him a higher reputation than had been enjoyed by any of his predecessors. In 138 he was adopted by the Emperor Hadrian, in consequence of his merits, and came to the throne in the same year. He died at Lugurii, Italy, in 161.

**Antony, Mark**, celebrated Roman general, was born at Rome in B. C. He took part in the civil wars of the republic, and with him was made consul in 44 B. C. After Caesar was killed, Antony, with Augustus, formed a triumvirate, which defeated the republican army of Brutus and Cassius at Philippi. Antony afterward visited Asia, and was slain by Cleopatra. His love for her made him forget the provinces he was to govern. When at the height of his power he was slain by a soldier so desperate that Augustus sent a force against him and defeated him in the naval battle of Actium. The greatness of his power was deserted by the Egyptian fleet. He took his own life in 30 B. C.

**Antony, Paul**, the most celebrated painter in ancient times, the son of Pythias, and probably born at Colophon, Asia Minor. He flourished about the fourth century B. C. He was a he and united the fine coloring of the Ionian, with the accurate drawing of the Sicilian school. He painted Colchis, and was the first of the second century, was born at Damascus. He worked at Rome for the Emperor Trajan, and built the temple of Venus which he dedicated to his name, but his greatest work was a huge bridge over the Danube at its confluence with the Al. He was killed by Colchis, and was buried in his name, but his greatest work was a huge bridge over the Danube at its confluence with the Al. He was killed by Colchis, and was buried in his name, but his greatest work was a huge bridge over the Danube at its confluence with the Al.

**Apollonius** (ap-pó'lon'í-us), of Perga, in Asia Minor, called "the Great Geometer," lived in the third century B. C. He is generally considered one of the founders of the mathematical sciences.

**Apollonius Rhodius** (Apollonius Rhodius) was born in Alexandria 280 B. C. He presided over an academy at Rhodes, was an

eminent rhetorician, and wrote a poem, in four books, on the expedition of the Argonauts, and other Classical subjects.

**Apponyi** (ap-pó'ny), **Count Albert**, Royal Hungarian Minister of Public Education since 1906, was born in 1856. He was a member of the late Chief Justice of the kingdom of Hungary. He has written many articles on questions of international politics, and in 1910 was elected to the German, English, and American magazines; visited United States, 1911.

**Apponyi, Count George**, Hungarian statesman, was born 1808. He was a member of the Presburg Diet of 1843, and chancellor of Hungary in 1847, when he opposed the revolut. movement, and then breaking out, and which caused his retirement in 1850. He was made a member of the imperial council in Vienna, and was instrumental in bringing about the reconciliation between Austria and Hungary. He is now among the ablest of European statesmen. Died 1899.

**Appuleius** (ap-pú'ly-us), a satirical writer of the second century, born at Numidia, Africa, studied at Carthage. He was so extremely popular that the senate of Carthage and other states erected statues in his honor.

**Aquinas** (a-quí'nos), **St. Thomas**, celebrated scholastic divine, born about 1227, died in 1274, was descended from the counts of Aquino, in the Kingdom of Sicily. He was educated at the Benedictine monastery at Monte Cassino, and at the University of Naples, where he studied for six years. About the age of seventeen he entered a convent of Dominicans, much against the wishes of his family.

He attended the lectures of Albertus Magnus at Cologne, in whose company he visited Paris, 1245 and 1246. Here he became involved in the dispute between the university and the Begging Friars as to the liberty of teaching, advocating the rights claimed by the latter with great energy. In 1257 he received the degree of doctor from St. Sorbonne, Paris, and began to lecture on theology, rapidly acquiring the highest reputation. In 1263 he is found at the Chapter of the Dominicans in London. In 1268 he was only lately landed at Rome, and died elsewhere. In 1271 he was again in Paris lecturing to the students; in 1272 professor at Naples. In 1263 he had been offered the archbishopric of Naples by Clement IV., but declined it. He was called on his way to Lyons to attend a general council for the purpose of uniting the Greek and Latin churches.

He was called, after the fashion of the times, the *angelic doctor*, and was canonized by John XXII. The most important of his numerous works, which were all written in Latin, is the *Summa Theologiae*, which, although only professing to treat of theology, is in reality a complete and systematic summary of the knowledge of the time. His disciples were known as *Thomists*.

**References**.—Vaughan's *Life of St. Thomas Aquinas*; Townsend's *Scholasticism of the Middle Ages*; and *Histories of Philosophy* by Erdmann and Leibniz.

**Arabi Ahmed** (ar-ab'ih) ("Arabi Pasha"), leader of the military insurrection in Egypt in 1882, was born in Egypt in 1823. He was called to his troops that he was inspired by the prophet to undertake a holy mission, the motto of which was, "God and the sword." He was killed, and became the leader of a great rebellion. After his defeat Arabi was banished to Cayron, but was permitted to return to Egypt.

**Arago** (ar-jé'), **Dominique**, celebrated French philosopher, was born at Estagel, France, 1786. He was in 1808 by the emperor Napoleon, and was an ardent of merit. His subsequent life was distinguished by an ardent and successful devotion to science. In 1818 appeared his *Recherches Observations géologiques, astronomiques, et physiques*. He died in 1853.

**Aratus** (ar-tó'us), a Hellenic statesman, born at Sicyon, Greece, 271 B. C.; died 213 B. C. He liberated Sicyon from the tyrant Nicles in 251, and he is said to have been poisoned by Philip of Macedon.

**Arbaces** (ar-bé'sé), one of the generals of Bardanes, who was sent in 876 to B. C. of the Median empire. The dynasty of Arbaces lasted until 899 B. C., when Cyrus overthrew it.

**Arbutnot, Bernard** (ar-but-not), **John**, British physician and poet, the much-loved friend of Swift and Pope, was born at Arbutnot, Scotland, 1674. He was educated at the University College, Oxford; but took his M. D. degree at St. Andrews, 1696. In 1708 he was appointed physician to the queen, and her death in 1714 was a severe blow to his prosperity. In 1715, along with Pope, he was elected Gay in the *Twelve Hours*. He was a friend of Swift, and a champion of literary fame. Arbutnot was the earliest, if not the sole author of the brilliant *Memoirs of Maritane*.



young men for the universities. Appointed head master of Rugby school in 1828, he raised that institution beyond the ordinary level of the remarkable success of his pupils and by the introduction of new branches of study into the Rugby school. The best known of his works are his edition of *Thucydides*, and his sermons delivered in the chapel of Rugby school. Died 1842.

**Arnold of Winkelried**, a Swiss of Unterwalden, who, according to tradition, made a way for his kinsmen into the castle of Morgarten in 1306, by grasping an armful of Austrian spearheads and plunging them into his own bosom.

**Arrhenius** (*arr'-eh'-ee-us*), a Swedish chemist, was born in 1859. At nineteen he received the degree of doctor of philosophy from the University of Uppsala. His chief contributions are in physical chemistry, more particularly in the theory of solutions, although his study of osmotic pressure added to our knowledge of that subject. Received Nobel prize for chemistry, 1903.

**Artian** (*ar'-ee-on*), or **Flavius Arrianus**, Greek historian, was born in Nicomedia, Bithynia, about 100 A. D. The emperor Hadrian made him a Roman citizen and governor of Cappadocia, in 136. When fifty years old he settled in his native city for the rest of his life.

**Artaxerxes I.** (*ar-tak'-ser'-ez*), king of Persia, surnamed Longimanus, the second son of Xerxes, escaped from the conspiracy of Artaban and others, who succeeded the throne in 424, and reigned, extending to 425, was marked by a decline of power. Died 425 B. C.

**Artaxerxes II.** (*ar-tak'-ser'-ez*), Marmoon, succeeded his father, Darius II., in 405 B. C. After gaining the victory over his brother, Cyrus, he became involved in a war with Sparta, which ended with the Antalcidean treaty of peace. Died 361 B. C.

**Artavertus III.**, surnamed Ochus, was the son and successor of Artaban, king of Persia. In the true style of oriental despotism until 338 B. C. One of his most daring exploits took place in Persia, where he caused the divine bull Apis to be slaughtered and cooked as ordinary beef. He was poisoned in 338 by his eunuch, Bagaces.

**Arvidsson** (*ar'-vid'-son*), a popular Finnish leader of the fourteenth century, was a brewer in Ghent. His wealth, eloquence, and talents made him the most prominent man on the side of the citizens in their struggles against Count Louis of Flanders. His power was secure for ten years, but in 1355 he was banished by Edward III. of England, persuading him to assume the title of king of France. To strengthen the alliance, he married the young daughter of Edward III. of England, persuading him to assume the title of king of France. To strengthen the alliance, he married the young daughter of Edward III. of England, persuading him to assume the title of king of France.

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**Arthur, Julian**, actress, was born in Hamilton, Ontario, 1869, of Irish and Welsh parentage; real name, Ida Lewis; first New York success at Union Square theatre in *The Black Magician*. Her debut, 1895, in Henry Irving's company, playing roles such as *Henry Irving*, *Marriv*, 1898, *Benjamin P. Cheney, Jr.*

**Asbury** (*as'-bu-ry*), Francis, the first bishop of the Methodist Episcopal church in America, was born in 1745. In 1765 he was appointed general assistant by John Wesley. He brought Wesley into the States of New York and Virginia, and to the revolution, when many ministers returned to England, he kept on in his labors. At the end of the war, it was decided that the Methodist Episcopal church for America, and he was ordained in 1784 as bishop, by his colleagues and already a member of the General Conference of England. For more than thirty years he worked earnestly and successfully, and the wonderful growth of Methodism in America was largely due to his efforts and ability. He died in 1816.

**Ascham** (*as'-ham*), Roger, English writer and classical scholar, was born at Wymondley, in Yorkshire. He wrote, in 1545, a treatise entitled *Towpschia*, the pure English of which ranks it among the classical pieces of English literature. For this treatise, which was dedicated to Henry VIII., he was awarded a pension. In 1548 he became master of Langley school, and in 1550, after Edward's death, and was subsequently appointed Latin secretary. Died 1568.

**Ascham, Lewis**, British diplomat, English diplomat, was born in 1774, eldest son of the eminent merchant, Sir Francis Baring. Having been employed as a special agent in America, as land to the United States to settle the northeastern boundary question in August, 1842, he concluded the famous treaty with the American government, by which the frontier line was definitely settled. Died 1848.

**Ascham, John**, American surgeon, educator, and author, was born at Philadelphia, Pa., 1839; acting assistant surgeon of United States army, 1862; professor of anatomy and surgery at the University of Pennsylvania, elected in 1877. His two prin-

cipal works are *Injuries to the Spine, and Principles and Practice of Surgery*. Died 1900.

**Ascham, John**, English scholar, was born at Litchfield, England, 1617; held the appointment of Windsor herald, and published the *History of the University of Oxford*. His last manuscript presented to the University of Oxford his valuable collection of coins, specimens, and manuscripts. Died 1692.

**Aspasia** (*as'-pa'-sh'-id*), a beautiful Athenian woman, said to have been a native of Miletus in Asia Minor. In order to marry her, Pericles repudiated his wife. An affront offered to Aspasia is said to have been the cause of the Peloponnesian war.

**Asquith** (*as'-kwith*), Rt. Hon. Herbert Henry, prime minister of England, was born in 1852, and was educated at Balliol College, Oxford, and was admitted to the bar, Lincoln's Inn, 1876. D. C. L., Oxford; D. D., Edinburgh and Glasgow. On the defeat of the Rosebury ministry in 1895, he resumed practice at the bar. He was one of the most effective speakers on the liberal side during 1903 on the education question and the war commission's report, and during 1903, 1904, and 1905, in opposition to Chamberlain's fiscal policy. Chancellor of the exchequer, 1905. He became prime minister 1908.

**Astor, John Jacob**, merchant, founder of the American fur company, was born near Heidelberg, Germany, 1763. After spending some years in the fur trade, he came to New York, where he invested his small capital in furs. By economy and industry he so increased his means that after 1800 he was able to acquire a large fortune. From this period, in spite of the war of 1812 and other temporary obstacles, his commercial connections extended over the entire globe, and his ships were found in every sea. He died in 1848, leaving property amounting to \$200,000,000.

**Astor, John Jacob**, capitalist, author, was born in New York, 1848; son of John Jacob, second, and Charlotte Augusta (Gibbes) Astor; married Mary, daughter of John Jacob Astor, the Astor fortune. Educated by private tutors, finishing in Europe; entered office of the Astor family, 1867; returned to England, 1870; owner *Fall Mill Gazette*, and *Fall Mill Magazine*.

**Atkins** (*at'-kin*), John, English statesman, was born in 1796, and died in 1868. He was a member of the House of Commons, and was chosen bishop of Alexandria in 1826. He is esteemed one of the most eminent among the ancient fathers of the church. He was a violent opponent of Arius; and his earnest advocacy of the Catholic faith, more particularly of the doctrine of the Trinity, subjected him to much persecution from the emperors Constantine and Julian, by both of whom he was several times exiled. Died in 327.

**Athenagoras** (*at'-hag'-er'-as*), a Christian philosopher, born at Athens, who lived toward the close of the second century. His conversion to Christianity had been likened to that of St. Paul. He was a native of Athens, and lived at Athens, at San Francisco, California, 1858, the daughter of Thomas L. Horn. She was educated at St. Mary's College, in Lexington, Kentucky; married George H. Bowen, Atherton, deceased. Author: *The Doctrines of the Bible*, *The Greek Church*, *The Greek Church*, *Patristic Epiphany* and *His Times*, etc.

**Atticus** (*at'-ti'-us*) **Hermodes**, **Tiberius Claudius**, a rich Athenian, born about 104 A. D. He was one of the best masters, having special attention to oratory, in which he greatly excelled. His lame right arm, upon immense expenditures of gold, was cured. Died 160 A. D.

**Atticus, Titus Pomponius**, born at Rome 106 B. C., was educated with Cicero and the younger Marius. He withdrew from the busy life of Rome, and retired to a villa in the Sabine country, where he devoted himself chiefly to study and the composition of treatises. His Latin writings have been preserved. But he has 396 epistles addressed to him by Cicero. Died 32 B. C.

**Atterbury** (*at'-ter-bu-ry*), Hugh, third in the fifth century. He styled himself "the scourge of God," and devastated Lombardy. The city of Rome was devoted by those who followed him. On his death, in 553, his body was buried in three folds, made of gold, silver, and iron. The capture of which his grave was put to death. **Atwater, George**, British mathematician, was born, 1746; died in London, 1807. He was educated at Cambridge University, became tutor of Trinity College, and was afterwards employed to illustrate the relations of time, space, and velocity

in the motion of a body falling under the action of gravity.

**Auber** (*au'-ber*), **Daniel François**, French composer of operas, was born at Caen, in Normandy, 1782. His opera *Maestri* is considered his best work. He has also written several operas, *Fre Diavolo*, *La Donna del Lago*, *Maestro Lasciat*, etc. In 1842, after the death of Cherubini, he was appointed director of the conservatory of music, Paris. Died, 1871.

**Aubigne** (*au'-bin-yeh*), **Jean Henri Merle d'**, See Merle d'Aubigne.

**Audubon** (*au'-du-bon*), **John James**, celebrated American naturalist of French descent, was born near New York, 1785. He was a naturalist devoted to natural history, but it was not until 1830 that the first of the four volumes of his great work, *The Birds of America*, was issued. His magnificent collection of plates, which was sold for \$1,000 a copy, was quickly followed by explanatory letterpress under the title of *American Ornithological Biography*. Died in New York, 1851.

**Auenbrugger** (*au'-en-brug'-er*), **Leonhard**, Austrian physician, was born in 1722. He originated the method of examining the lungs by percussion of the chest, and published the results of his investigations in a treatise which marks an epoch in the history of medicine. He died, 1809.

**Auerbach** (*au'-er-bach*), **Berthold**, German author, was born in 1832, at Weimar. He has abandoned the study of Jewish theology, he devoted his attention to literature. His first publications were *Idyllen* and *Novellen*. He was a translator of the works of Spinoza. By some his *Am der Höhe*, "On the Heights," is regarded as his best novel. He has also written a play, *Die Juden*, by the English title, *The Castle on the Rhine*. Died at Cannes, France, 1882.

**Auerberg** (*au'-er-ber*), **von, Anton Alexander**, famous Austrian naturalist and poet, whose pen-name was "Anastasia Grün"; was born at Laxenbach, Austria, in 1807. He was a member of the Frankfort parliament of 1848, and later of the Austrian Reichsrath. Died at Graz, Austria, 1872.

**Aurelian** (*au'-re-li-an*), **Flavius Aurelius**, duke of Castile, marshal and peer of France; one of the most brilliant and intrepid of the last of great French monarchs. He was gathered around himself; was born in 1751. His services were so conspicuous that he was made a general, and was made general of a division. In 1797 he was appointed to the command of the army of the Rhine; but after a short time he was removed to the command of the tenth division. In 1800 he received the command of the army in Italy, and in 1805 he was made a marshal, and in the following year he commanded a division in the campaign against the Vorarberg. Died in La Haye, 1816.

**Augustine** (*au'-gu'-stin*) **Aurelius Augustinus**, St., a renowned father of the Christian church, was born at Tagaste, in Africa, in 354. His father Monica being a Christian, his father Patricius a pagan. His parents sent him to Carthage to complete his education, but he disappointed their expectations by his neglect of serious study and his devotion to pleasure. A lost book of Cicero's, called *Hortensius*, led him to the study of philosophy; but dissatisfied with this he went over to the Manichaeans. He was one of their disciples for nine years, but left them, went to Rome, and thence to Milan, where he became a teacher of rhetoric.

St. Ambrose, the bishop of this city, converted him to the faith, and his writings on reading of the scriptures wrought an entire change in his life and character. He retired into solitude, and prepared himself for baptism, which he received in his thirty-third year from the bishop of Milan. He returned to Africa, he sold his estate and gave the proceeds to the poor, retaining only enough to support him. At the desire of the people of Hippo, Augustine became the successor of his bishop in that town, and devoted to extraordinary success, and in 395 succeeded to the see. He entered into a warm controversy with Pelagius concerning the doctrines of free-will, grace, and predestination, and wrote treatises concerning them, but of his various works his *Confessions* is most secure of immortality. He died August 28, 430, while Hippo was besieged by the Vandals.

He was a man of great enthusiasm, self-devotion, zeal for truth, and powerful intellect, and though there have been fathers of the church more learned, none have wielded a more potent influence. He has left a large autobiographical, polemical, homiletic, exegetical. The greatest is the *City of God* (*De Civitate Dei*), a vindication of Christianity. His *Confessions* also gained wide popularity. References: *St. Augustine and Post-Nicene Fathers*; Milman's *Latin Christianity*; Mosley's



**Augustinism**, Cunningham's *St. Austin*; Harneck's *Hist. of Doctrines and Movements and Confessions of Augustines*; Hlatfeld's *St. Augustinus*; Hainy's *Catholic Church*; Schaaf's *Life and Labors of St. Augustine*; Baillie's *Augustine and His Age*. For an unfavorable estimate, see Allen's *Continuity of Christian Thought*.

**Augustus, Caius Julius Caesar Octavianus**, Roman emperor, born 63 B. C., was the son of Julius Octavius and Lucia, niece of Julius Caesar, by whom he was adopted when but four years of age. He was in Ephesus when Julius Caesar was assassinated, but speedily returned to claim his inheritance. At the age of thirty-six he became emperor, with the title of Augustus. His reign was fortunate, good laws were framed in it, and the arts flourished under his protection. He died 14 A. D.

**Aurélianus (or-a-li-ä-nus), Claudius or Lucius Domitius**, emperor of Rome, was born in Pannonia, 212 A. D., the son of a senator; entered the Roman army, his exploits in which attracted the notice of the emperors Valerian and Claudius, and on the death of the latter in 270 he was proclaimed emperor. The emperor's severity made him feared even by his friends, who, as they deemed in pure self-defense, conspired against him and put him to death 275 A. D.

**Aurangzeb (or-ang-zeb)**, emperor of India, known as the Great Mogul, was born in 1627, the son of a poor, but his career was brilliant. His son disturbed his latter days by attempting to depose him. He died in 1707.

**Austen, Jane**, English novelist; born in 1775, at Steventon, Hants, England, of which parish her father was rector. Her works are *Pride and Prejudice*; *Sense and Sensibility*; *Emma*; *Mansfield Park*; *Northanger Abbey*; and *Persuasion*. They are all excellent, and distinguished by naturalness, and fidelity of delineation, qualities in which the literature of her time was most deficient. She died at Waterlooville, 1817.

**Austin, Alfred**, English poet, novelist, and journalist; born at Headingly, near Leeds, 1835; took his degree at the University of London, 1858; admitted to the bar, 1857; has published *The Secret, a Satire*; *The Human Tragedy*; *Introductions*; *Decorations*; *English Lyrics*, etc. He has also plays, and various political papers; was made fifteenth poet laureate of England, 1869.

**Austin, John**, eminent English lawyer and legal writer, was born at Cretingham Mill, Suffolk, England, 1790. He was professor of jurisprudence at the University of London from 1825 to 1835, and wrote *Province of Jurisprudence Determined* and *Lectures on Jurisprudence*. Died 1859.

**Aubrey (or-ber-ee), Lord, Sir John**.

**Avverroës (or-er-ä-ä)**, originally Ibn Rohd, or, more fully, Mohammed-Ibn-Rohd, the most famous of Arabian philosophers, was born at Cordova, Spain, 1126.

**Avery, Elroy McKendree**, author, historian, born in Ann Arbor, Mich., July 14, 1844; graduated at University of Michigan, 1867; served in civil war; mustered out at close as sergeant-major of 11th Michigan volunteer cavalry. Member of many historical and economic societies. Author: *Elementary Physics*; *Elements of Natural Philosophy*; *Physical Science*; *History of the United States*, etc.

**Avicenna (or-er-ä-ä)**, properly Ibn Sina or, more fully, Abu Ali Al-Hossein Ibn Abdallah Ibn Sina, a famous Arabian philosopher and physician, whose authority for many centuries passed for indisputable; born 980, at Chirmatane, a village near Meshkadeh. Died 1036.

**Avogadro (or-ä-ä-ä-ä)**, Amadeo, Italian chemist and physicist, was born at Turin, Italy, 1776; died there, 1856. Professor of physics at Turin; formulated his celebrated law concerning the atomic theory in 1811.

**Ayresbush (or-ä-ä-ä-ä)**, the favorite wife of Mohammed, was born at Medina in 610 or 611 A. D. She was only nine years of age when she married the prophet. She bore him three children, Mohammed, by his request, was carried to her house and expired in her arms. After the prophet's death Ayresbush took active part in the plot which deprived Caliph Othman of his power and life, and headed a force to restore the accession of Ali. Died 678.

**Baccio della Porta. See Bartolomeo, Fra.**

**Bach, Johann Sebastian**, (bäk) in some respects the greatest musician that ever lived, son of Johann Ambrosius, was born in 1685, and died July 30, 1750. He was treble singer in a choir at Luneburg until his voice changed, when he became a violinist of the court at Weimar. When he was twelve years of age he became organist at Arnstadt, in 1708 became court organist at Weimar, and in 1714 concert master to the duke, with the additional duty of composing and conducting the vocal music of the churchpeople. After he had served as chapel master to the court at Köthen, the city authorities of Leipzig elected him in 1723 musical director of the Thomas School, where he labored for the remainder of his life. He published few works, but left a great number

in manuscript. The Bach society at Leipzig was engaged from 1850 to 1900 in publishing a complete collection of his compositions, which embrace a great variety of church music, both vocal and instrumental and many other works for the organ, harpsichord, orchestra, and solo instruments. He died a century ago. As a virtuoso upon keyed instruments he had no rival.

**References.**—The most complete edition of his works is that issued by the Bach Society, in 56 folio volumes. See *His Life by Miss Jay Shuttleworth*, and the greatest work on his subject, by J. J. von Baer.

**Bach, Karl Philipp Emanuel**, German composer, second son of Johann Sebastian, was born at Weimar, in 1734; died at Hamburg in 1788. He was probably the most highly gifted of the eleven brothers, and his influence on the development of certain musical forms gives him a prominent place in the history of the art. His most ambitious composition is the oratorio *Israel in the Wilderness*.

**Bache (deh), Alexander Dallas**, president, great-grandson of Benjamin Franklin, was born at Philadelphia, 1806. He was president of Girard College 1836-42, where he established a meteorological and music observatory. Died at New York, R. I., 1867.

**Bachman, William**, physician and chemist, was born at Philadelphia, Pa., 1792; he published *System of Medicine* in 1819; was professor of chemistry at Jefferson College, 1820-21; in 1821 he held same chair in Jefferson Medical College, Philadelphia, in 1841. Died 1864.

**Bachman, William**, novelist, born at Pierpont, N. Y., 1839; graduated from St. Lawrence University, 1862; actively connected with press of New York for many years; for several years, editor of the *New York World*; author of *Eben Holden*; *The Handmaid's Gentleman*; etc.

**Bachman, Alexander Dallas**, president, a famous marine painter of the Dutch school, was born at Emden in Hanover in 1631, and died at Amsterdam in 1708.

**Bacon, Alice Mabel**, author, educator, was born at New Haven, Conn., 1858; educated in private schools, and took the Harvard examinations in 1880; taught at Hampton, Institute, 1880-81; founded Dixie hospital for training colored nurses, 1880. She has also been successful as a lecturer on health, literature, character, and domestic life.

**Bacon, Augustus Octavius**, lawyer, United States senator from Georgia; born in Bryan county, Georgia, 1810; graduated at University of Georgia, 1832; practiced law in 1839; in law practice in Macon, Georgia, since 1860; delegate national democratic convention, 1860; elected to United States senate, 1869; reelected, 1901 and 1907. He is and for many years has been a trustee of the University of Georgia, and one of the regents of the Smithsonian Institution.

**Bacon, Benjamin Wisnack**, biblical writer and critic, professor of Hebrew at the University of Cambridge, England, since 1896; was born at Litchfield, Conn., 1801; graduated from Yale, 1821; B. D., Yale, 1834. Director of the American School of Oriental Research in Jerusalem, Syria, 1905-06. Author: *The Genesis of Genesis*; *Triple Tradition of the Bible*; *Introduction to a Commentary of the New Testament*; *The Sermon on the Mount*.

**Bacon, Francis**, Baron Verulam and Viscount St. Albans, English lawyer, statesman and philosopher, was born at York House, London, 1561. In 1576 he went to France with Sir Amyas Paulet, the English ambassador, and stayed there until his father's death in 1579, when he returned to England, and was sent to study law at Gray's Inn, and in 1584 started on a parliamentary career as member for Melcombe Regis, in Dorsetshire, and soon became distinguished in the House as an orator. The great blot in his career during the reign of Elizabeth was, according to Marquay and others, his prosecution of his friend Essex, which they maintain was undertaken "not for his fault, but for their fault."

After the queen's death, in 1603, Bacon rapidly rose in fortune and favor. He was knighted in 1603, became solicitor-general in 1607, attorney-general in 1613, privy councillor, 1616, justice of the peace, and in 1618 Baron Verulam in 1618, and Viscount St. Albans in 1620.

But his fall was as rapid as his rise. The patent of monopoly, which he secured in 1609, for the obnoxious patents consisting in alehouses and inns, and monopolies of gold and silver thread, in which both the king and Buckingham's family were interested. This led to their abolition, 1616, inducing him to incur his enemies at once started a crusade against "the reformer of abuses." A committee was appointed to inquire into "the abuses of the courts of law, and the abuses of the courts of equity," and he took "rewards to pervert justice," and

maintained that he only "partook of the abuse of the times." It was denounced by his peers.

But the sentence on him was never carried into effect; his imprisonment lasted only four days; his huge fine of £200,000 was remitted; his pardon was passed under the great seal of England in 1625, because he was sent to New York House, the place of his birth, to Buckingham; a pension of \$6,000 a year was granted to him; and he was summoned to resume his seat in the house of commons.

It was after he retired from political life that Bacon practically began his literary career as one of the world's great philosophers. To that time his only acknowledged works had been several editions of *De Augmentis Scientiarum* and augmented on every occasion with infinite care—his *Advancement of Learning*, in 1605, and his *Novum Organum* in 1620. The last five years of his life were full of work. In March, 1622, he produced his *History of Henry VII.*; in November, 1622, his *Historia Venturum*; in January, 1623, his *Historia Vitæ et Morte*; in October, 1623, his *magnus opus*, entitled *De Scientiarum*, a Latin translation, with large additions, of *The Advancement of Learning*; in December, 1624, his *Apophthegmata*; and in 1625 his *Translation of the Four Books of Aristotle's Nicomachean Syllogism* (1627), was published posthumously along with the *New Atlantis*.

Bacon was great as a moralist, a historian, a writer on politics, and a philosopher, but it is as the father of the inductive method in science, as the powerful exponent of the principle that facts must be observed and concluded before theorizing, that he occupies the grand position in the history of the world's great. His moral character, however, was not on a level with his intellectual, self-gratification being the main aim of his life. He was a very selfish character, and his work is James Spedding, who edited *The Letters and Life of Bacon*, in 7 volumes, and his moral character is bold and unscrupulous. It is also worthy of perusal. See also *Church's Life of Bacon*, in the English "Men of Letters" series.

**Bacon, Nathaniel**, lawyer and member of Governor Boscawen's council, was born at Exeter, 1730; took part in the American Revolution; was a member of the Massachusetts legislature; in 1780 he was forced to make many concessions to demands for better government; but he broke his promises, and in 1781 he was elected governor. He was burned, 1776, and the governor took shelter in an English vessel. Died in Virginia, 1777.

**Bacon, Nathaniel**, English politician, was born about 1214. The most learned man of his day, he is reputed to have advocated the change since made in the calendar, to have invented gunpowder, and is known to have manufactured magnifying glasses. Died, 1294.

**Baden-Powell (bä-dén-pö-ä, or pow-ä), Robert Stephenson Smyth**, British general and inspector-general of cavalry, was born 1857, and educated at Charterhouse, London. In 1876 he joined the 13th English hussars, and served as adjutant of that regiment in India, Afghanistan, and South Africa. In the Boer war he was given command of the 5th colonial guards, and with a force of 1,200 men was engaged in Mafeking, which he held against the Boers from a few days following the outbreak of the war until May 1900, and was severely wounded. He was promoted to the rank of major, and recorded in modern warfare; afterwards organized the South African constabulary. He is the author of *Boy Scouts of America*, and *Scout's Vade Mecum*, *Cavalry Instruction*, *The Downfall of France*, *The Malakal Campaign*, and on *Peasants' War*.

**Baedecker (bä-dä-ä-ä), Karl**, German publisher at Coblenz, the originator of a series of admirable editions of German literature, since 1872 at Leipzig. Born 1801; died 1859.

**Baer, George F.**, railway official, lawyer; born in Somerset county, Pa., 1842; educated at Franklin and Marshall College, Lancaster, Pa., 1860; became a lawyer in 1862; elected captain, joined army of Potomac at second battle of Bull Run and took part in all subsequent battles, including Chancellorsville, when he was detailed as adjutant-general second brigade; counsel for Philadelphia & Reading, 1870; became a lawyer in 1871; became a legal adviser in Pennsylvania of J. Pierpont Morgan; elected, 1901, president of Philadelphia & Reading railway; president of Philadelphia Coal and Iron company, and Central Railroad company, of New Jersey.

**Baer, Hermann von**, Russian naturalist, founder of modern embryology, was born in Eshonno, Rumania, 1792; died at Leipzig, 1876. He was educated at Göttingen, and became a professor in the University at Königsberg, where, in 1828, he published *The Development of Animals*, a work of careful observations, and philosophical re-  
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tions that are most remarkable for clearness and thoroughness.

**Becher** (bē'cher), Adolf, German chemist, was born at Berlin, Prussia, 1835. In 1872 he became professor of chemistry at the University of Strassburg, and was lecturer in chemistry there in 1875. He discovered cerulin, emodin, and indol, besides making other valuable contributions to the chemistry of organic substances.

**Becholt** (bē'olt or bē'ult), Walter, English economist and politician, was born at Langport, Somersetshire, 1826. From 1852 to 1855 he was in 1842 to University College, London, where he took his M. A. degree in 1848; in 1852 he was admitted to the bar at Lincoln's Inn. He was a banker and shipowner at Langport. His works include *The English Constitution*; *Physics and Politics*; *Commercial Society*; *Economic Studies*, and *Biographical Studies*.

**Beckens** (bē'gēns), Jens, Danish poet and author, was born at Korsør, on the island of Zealand, 1764, and died at Hamburg, 1826. His German works fill 8 volumes; his Danish 12 volumes. Chief among them are his *Comic Tales*, *Lyabrythens*, and *Parthenia*.

**Beiley, Joseph Weldon**, lawyer, United States senator, 1901-13; born in Copiah county, Miss., 1863; admitted to bar, 1883; presidential elector, 1884; removed to Texas, 1888, and began practice as law at Gainesville; became U. S. senator in 1888. He was chosen United States senator to succeed Hon. Horace Claiborn in 1891, re-elected in 1897. He is considered one of the ablest lawyers and debaters in the senate.

**Beiley, Liberty Hyde**, scientist, director of College Agriculture at Cornell University, 1903; born in South Haven, Mich., 1858; graduated at Michigan Agricultural College, M. S. 1882; professor of horticulture and landscape gardening at Michigan Agricultural College, Cornell, 1882-83; professor of horticulture and landscape gardening at Michigan Agricultural College, Cornell, 1883-1903. Author: *Survival of the Unfit*; *Evolution of our Native Fruits*; *Plumona with Platanus*; *Principles of Fruit Growing*, etc.

**Beille** (bē'il), Joanna, Scotch poet and dramatist, was born 1762, in Borthwick, Scotland. In 1782 he went to reside in London, and in 1800 took up her residence at Hampstead, where she remained until her death in 1851. Her most important work is undoubtedly the nine *Plays on the Poets*. Her *Family Legend*, produced at Edinburgh under Scott's management, was the first play of Nelson in Trafalgar square, London, and the bar-beries on the south side of the marble arch in Hyde Park are the work of Beille.

**Bain, Alexander**, Scottish writer on mental philosophy, was born at Aberdeen, Scotland, in 1818. He was so because of his mental philosophy, the verity of Aberdeen, and lord tutor there. His chief works are: *The Senses and the Intellect*; *The Emotions and the Will*; *Logic and Logic*; and *Education as a Science*. Died 1903.

**Bain, Robert Nisbet**, assistant librarian British museum, since 1883, was born at London in 1834; was educated privately. In business in London until 1883. He has published numerous translations from the Russian, Ruthenian, Roumannian, Hungarian, Swedish, Danish, and Finnish, chiefly fairy tales and novels.

**Bainbridge, William**, American naval officer, was born at Princeton, N. J., 1774, and died at Philadelphia, 1833. He was actively engaged in the Mediterranean in successive commands of the frigates *George Washington*, *Essex*, and *Philadelphia*, was twice captured by the French, and had to surrender his ship to the French. In the war of 1812 he captured the British frigate, *Juno*, for which congress voted him a gold medal. During the remaining part of the war he was in charge of the Charleston navy-yard.

**Baird, Spencer Fullerton**, American naturalist, was born at Reading, Pa., 1823, and died at Philadelphia, 1898. He was secretary of the Academy at Dickinson College, Carlisle, Pa., and was afterward professor of natural science at that institution. He wrote many papers on birds, insects, fishing, etc., and under his direction the national museum was begun in 1850. In connection with other editors, he published *The Birds of North America*, *The Mammals of North America*, and a *History of the Birds of North America*, in five volumes. He died 1897.

**Bajazet I.** (bē'jāzē), sultan of the Turks, was born in 1247. In 1289 he succeeded his father, Murad I., who fell in battle near Kozluk, fighting against the Serrians. In three years he conquered Bulgaria, a part of Serbia, Macedonia, and Thessaly. From the rapidity of his conquests, extraordinary conquests were effected he received the name of *ilidrim*, i. e., lightning. Died 1343.

**Baker, Alfred**, geologist, and professor of mathematics at the University of Toronto since 1887; was born at Toronto; graduated from the University of Toronto, 1867; received his M. A. in mathematics. Elected by graduates a member of senate of University of Toronto, 1887-1900; declined from queen's own rule, and was elected captain; F. R. S. Canada; and of the American mathematical society; president of the Ontario Educational association, 1885; president of section, 111, royal society of Canada, 1905. Author of

articles relating to quaternions, geometry of position, and foundations of geometry in the proceedings of the royal society of Canada, also editor of treatises on synthetic and analytical geometry.

**Baker, James H.**, educator, president of the University of Maine, 1887; was born at Bangor, Maine, 1848; educated at Bates College, Lewiston, Maine. President national council of education, 1897. Author of *Elementary Psychology*; *Education and Life*, and *American Psychology*, now of American register.

**Baker, Ray Stannard**, author, was born at Lansing, Mich., 1857; graduated at Michigan Agricultural College, 1880; took his M. A. at Michigan, and studied in literature at University of Michigan. He traveled extensively. Member national council of education, 1897. Author of many articles and stories to American and English magazines. Was associate editor of *McClure's Magazine*, now of American register.

**Baker, Sir Samuel White**, British African explorer, was born at London, 1821. He explored the western arm of the Nile and discovered the Albert Nyanza lake; organized an extensive agricultural colony in Africa; he wrote *High Nile*; *Wanderings in Egypt*; *The Albert Nyanza*; *The Nile Tributaries*; *Assuati*, etc. Died at Newton Abbot, England, 1893.

**Balboa, de Vasco Núñez**, Spanish conqueror, was born at Xerez-de-Cadiz in 1476. After having been a private soldier, he joined the expedition took part in the great mercantile expedition of Rodrigo de Bastidas to the new world. An insurance which took place at the time of the expedition, he was the first to suggest the idea of a new enterprise in the new colony, which was succeeded by Pedrarias Davila, by means of the Balboa, the Spanish monarch, and the Balboa was in a situation Balboa made several successful expeditions. On September 25th of 1513 he reached the first sight of the Pacific Ocean, and a mountain-top in the isthmus of Panama. He took possession of it in the name of his sovereign, Ferdinand, and in 1517 on the charge of a contemplated revolt.

**Balding** (bē'ding), Hans, called also Hans Grub, was born at Hamburg, 1600. He was the son of Albertus Druus, was born in Grunnd, Swabia, 1476; died at Strassburg, 1545. His masterpieces are the wood-cut engravings, *Die Kunst der Freuburg*; his wood-engravings are numerous.

**Baldwin I.**, first Latin emperor of Constantinople, was born at Valenciennes, France, 1080. He was a knight in crusading, he died in 1206.

**Baldwin, James Mark**, psychologist, born in Connecticut, 1861; graduated at Yale, 1884; A. M., 1887; Ph. D., 1889; Sc. D., Oxford University, England, 1900; professor psychology, 1900-1903; president of the American Psychological Association, since 1903. Author: *Social and Ethical Interpretations in Mental Development*; *The Mind and the Body*; *Psychology and Science*; *Development and Evolution*. Editor-in-chief: *Dictionary of Philosophy and Psychology*.

**Baldwin, John**, American jurist, was born at New Haven, Conn., 1840; graduated from Yale, 1861; studied law at Yale and Harvard law schools; L. L. D., Harvard, 1891; admitted to bar, 1863. Member faculty, Yale law school since 1869, and now professor of constitutional and private international law; associate justice, 1893-1896, chief-justice 1900-1910, supreme court of errors, Connecticut; governor since 1910.

**Balfie** (bē'f), Michael William, British composer, born at Dublin, Ireland, 1868. After singing at Paris in the Italian opera under Rossini, he emigrated to Italy and produced in 1840 several operas. In 1835 he went to England as a vocalist composer, and after five years of successful command of the opera, he died in 1870.

**Balfour** (bē'fūr), Arthur James, British statesman and author, was born at Glasgow, in 1832; educated at Eton, and Trinity College, Cambridge; secretary for Scotland, with a seat in the cabinet, 1868-70; secretary for Ireland, 1870-72. He carried the crimes act through parliament; first lord of the treasury and leader of the house on the death of W. E. Gladstone, and again in 1895-1905. On the retirement of Lord Salisbury in 1902, he became prime minister and lord privy seal, retaining the office of first lord of the treasury. When Chamberlain made his fiscal proposals, 1903, Balfour, holding that the country was not ripe for the taxation he knew, committed himself and the government only to a policy of reticence. At the end of 1905 he and his cabinet resigned, and he was succeeded by Asquith.

**Balfour, Robert**, English geologist, born at Edinburgh, 1851; educated at Trinity College, Cambridge, 1870 and 1882 he brought forward the theory of the evolution of the different stages of animals in his *Comparative Embryology*, a work of the greatest value to students of comparative anatomy. He was the first to suggest the idea to climb one of the spurs of Mount Blanc.

**Balfour, Robert**, English geologist, born at Balfour, Scotland, in 1832, and died in 1895. He was the first to suggest the idea to climb one of the spurs of Mount Blanc.

crowned king September 24, 1332. But most of the people did not want him, and after a reign of only a few months he was deposed and died in 1363.

**Balio, John**, king of Scotland, was born in 1250. Through his mother who was connected with the royal family, he became a competitor for the throne with Robert Bruce. The question was left to Edward I., who was born in 1272. Balio, who swore obedience to him as his feudal lord. In consequence of his oath, he soon found he had no real power, and in 1294 he was obliged to settle on his Norman estates, where he died in 1314.

**Balmer, Robert Stawell**, British scientist, Lowndean professor of astronomy and geometry, Cambridge, director of the Cambridge observatory since 1845; was born at Dublin, Ireland, 1806; graduated from Trinity College, Dublin. Hon. M. A. Cambridge, 1822; L. L. D., Dublin, Royal astronomer, 1822, 1824, 1826, 1828. Author: *A Treatise on the Theory of Spherics*; works on astronomy.

**Balmaine** (bē'lānē), William, British lawyer, was born in London, 1812; admitted to the bar in 1834, and soon obtained a large practice, chiefly in criminal cases. He wrote *Experiences of a Barrister's Life*, and *Old World and the New*. Died 1887.

**Bailou** (bē'lō), Hoven, American preacher and founder of the Universalists, was born in New England, 1772. He was expelled from his church on declaring his belief in the final salvation of all men. He married in 1801, and in 1819, he was expelled from his church by his grandnephew, began the *Universalist Expositor*, a quarterly publication. Died 1858.

**Balmaceda** (bē'lānē-dē), José Manuel, Chilean statesman, was born in 1840; president of the republic in 1886. He was elected to the congressional party and himself, he was defeated and committed suicide in 1891.

**Balmaine** (bē'lānē), William, British lawyer, born at Kipling, in Yorkshire, about 1580, entered parliament in 1609, was knighted in 1617, and in 1619 became chief justice of the common law. In 1621 he had despatched colonists to a small settlement in Newfoundland, and in 1627 he visited the colony. He was several times induced him to sail southward in search of a more genial climate, but his attempts to settle in Virginia led to disputes with the colony, and he was expelled from the charter. He died in 1632, and the patent was granted in June of the same year to his son, Cecil, second Viscount of Devonshire.

**Balzac** (bē'zāk), Honoré de, a celebrated French novelist, was born at Tours in 1799, died 1850. Before completing his twenty-fourth year he had published a number of novels, and after his marriage he was a frequent success attending all was very indifferent; and it was not till 1829, by the publication of *Le Dernier Chouan*, a tale of La Vendée, and the first novel in which Balzac specified his name, that the attention of the public was diverted to the extraordinary genius of the author. A still greater popularity attended his *Physiologie de Mariage*, a work full of piquant and caustic observations on human nature. He wrote a large number of novels, all marked by a singular knowledge of human nature and distinct delineation of character, but apt to be marred by exaggeration.

Among his best-known works are: *Scenes de la Vie de Province*; *Scenes de la Vie Parisienne*; *Le Père Goriot*; *Eugenie Grandet*; and *Le Médecin de Campagne*. He was the author of this last, in 1835, led to a correspondence between Balzac and the Countess Eveline de Hanaka, a Polish lady whom, after about fifteen years, he visited and married. He collected edition of his works under the title *La Comédie Humaine* began to appear in 1899. Numerous English translations have appeared, of which the best is the series by Miss Worsley (1890-3), with a memoir of Balzac.

**References**—Saintsbury's *French Novelists*, and Balzac's *Life*, written by his sister; Théophile Gautier, *Le Balzac*, which is a collection of literary portraits; Taine's *Essays*; and Salazar's *Notes*.

**Bancroft, George**, American historian, was born in 1800, near Worcester, Mass.; graduated from Harvard College in 1817; preceded in 1818 to Göttingen, Germany, to study law. He was subsequently he traveled through Germany, and formed an acquaintance with Goethe and Schiller. He was then he returned to America as a politician, and was made collector of customs at Boston. When Polk was elected president, in 1845, he was appointed Bancroft secretary of the navy. In the autumn of 1846 he was sent by Polk as ambassador to England, where he remained until 1849. He was the author of *History of the United States*. He published the result of his labors in his *History of the Revolution in*



**Barileone, Oreste** (*bar'le-on-ma-ri*). *Fra* (properly *Baccio della Porta*) one of the most distinguished painters of the Florentine school. He was born in Florence in 1478. His subjects are mostly all religious, and by far the greater part of his pictures belong to the religious class. He was a warm adherent of Savonarola, after whose tragical end in 1500 assumed the Dominican habit. Barileone died in Florence in 1537.

**Barton, Clara**, philanthropist, founder and organizer of national Red Cross Society in the United States, president of the Red Cross for the year 1930; graduate of Clinton liberal institution, New York. During civil war did relief work in battlefield and organized relief for the wounded. She laid out grounds for national cemetery, Andersonville, 1865; secured adoption of treaty of Geneva, 1864; first president American Red Cross; managed American amendment of Red Cross, to provide for greater calamities of peace; distributed relief Johnsons flood, 1892; at request of president of United States carried relief to Cuba, 1898; did personal field work, Spanish-American war; president national first aid association since 1905.

**Bartich** (*bar'ich*), **Karl Friedrich**, German philosopher; born at Spottau, Silesia, 1814; studied at Breslau, Berlin, Halle, Paris and Oxford; professor of philosophy at Rostock, 1858-71; at Heidelberg, 1871-88. Died, 1888.

**Bartoli** (*bar'toli*), **Antoine**, French sculptor, born at Paris, in 1795. He was at first an engraver and metal-worker. His famous bronze is a lion struggling with a man, which is on the cross of the legion of honor. He died at Paris in 1875.

**Bartow, John**, American educator, former president of the University of Wisconsin, was born at Genoa, N. Y., 1827; graduated at the University of the City College, and six years later from Andover theological seminary; was for twenty years professor of rhetoric at Williams College, and was president of Wisconsin University. He retired from Wisconsin, 1887, and accepted the chair of political science at the University of Chicago, resigned, 1901. Author: *Political Economy*; *Aesthetic*; *Philosophy of Rhetoric*; *Principles of Psychology*; *Philosophy of Religion*; *Comparative Psychology*.

**Bathford, James Whitford**, bishop of Methodist Episcopal church since 1904; was born at Fayette, W. Va., 1814; graduate from University of Wisconsin, 1873, A. M., 1876; pastor M. E. churches in Boston, Auburn, Mass., and Buffalo, N. Y., 1875-89; president Ohio Wesleyan University, 1889-1904.

**Baudi** (*baud'ee* or *ba'di*), **Salust**, surname the Great, bishop of Cambray, where he was born about 329, in one of the most eminent of the Christian fathers. The attempts which he made to unite the two hostile churches of the East and West were unsuccessful. Died 379.

**Beattie, Charles**, chemist, born in Roxbury county, Mass., 1870; graduate from University of Virginia, 1890; professor of chemistry, college of the city of New York, 1891-1900. Author: *School Chemistry*; *Key to School Chemistry*; *Radium and Its Applications in Medicine*.

**Beckert, John**, English printer and letter-founder, born 1706 in Wrothamshire; began about 1750 to make experiments in letter-founding, and succeeded in making types which have scarcely yet been excelled. Died 1775.

**Beckett, John Spencer**, educator, born at Tabor, N. C., 1867; graduated from Trinity College, N. C., 1888; Ph. D., Johns Hopkins, 1894; professor of history, Trinity College, N. C., 1893-1906. Smith College, Mass., since 1900. Author: *Constitutional Beginnings of North Carolina*; *Slavery in the State of North Carolina*; *The War of Revolution*.

**Beastie, C. F.**, economist, professor of political economy, Durr University, since 1885; professor of jurisprudence, since 1892, at the University of Dublin University, since 1902; born at Chesham, County Cork, Ireland, graduated from Trinity College, Dublin, 1869. Author: *Theory of International Trade*; *The Theory of Nationality*; *Public Finance*; contributor to *Encyclopedia Britannica*; *Harmenutic Encyclopedia*.

**Beaumont** (*bea'mont*), **Adolf**, German traveler and ethnologist, author of nearly fifty works, was born at Bremen, 1826. In 1846 he became a professor of ethnology at the University of the ethnological museum. Died, 1905.

**Beaston** (*bea'ston*), **Henry Charlton**, English physiologist, was born at Falmouth, Cornwall, 1817. He went to a private school at Falmouth proceeded to University College, London, where he became professor of pathology, 1842, and was afterwards lecturer of the principles and practice of medicine. He is the champion of the doctrine of spontaneous generation. He has written: *On the Nature and Origin of Life*; *The Brain as an Organ of Mind*; *Parasitology—Cerebral, Bulbar, and Spinal*.

**Beck, Blanche**, actress; born in Portland, Ore., 1825. First appearance on stage at Stockton theater, San Francisco, 1841; played leading parts in various comedies, 1846-96; appeared in Shakespearean roles Augustus Daly's company, 1850; later starred in *The Great Ruby*, *Madame Butterfly*, and in *The Darling of the Gods*.

**Beck, John Lewis**, governor of Maine; born at North Eaton, Mass., 1859; graduated from

Boston University, 1882, law department of same in 1885. Member Boston common council, 1890; member of the House of Representatives, 1900-1-2; governor of Massachusetts, 1903-4; United States trust company. President of the Maine State Bar Association.

**Bates, Katharine Lee**, author, educator; born Falmouth, Mass., 1859; graduated Wellesley College in 1881; studied in Europe; history literature; 1888-91 associate professor, and in 1891 professor in charge, Wellesley College.

**Baur, Louis**, French philosopher and historical writer, and biblical expositor of the Hegelian school, was born at Eisenberg, Germany, 1817. In 1826 he turned to the study of history, embracing a number of critiques on the gospels and Pauline epistles; one on Strauss's *Life of Jesus*. On theological subjects Baur has been called the "Voltaire of Germany."

**Baur, Louis Agricola**, scientist, magnetist; born in Cincinnati, Ohio, 1865; graduated from University of Cincinnati; astronomer and magnetic computer, United States coast and geodetic survey, 1887-92; inspector magnetic work and chief terrestrial magnetism division, United States coast and geodetic survey, 1899-1906; director department terrestrial magnetism, Carnegie Institution since 1906; editor *Terrestrial Magnetism and Atmospheric Electricity*.

**Baur, Ernst** (*bea'ernst*), **Alexander Gottlieb**, the founder of the science of aesthetics, or the philosophy of the beautiful, was born at Berlin, 1792. He studied in Halle and Berlin, and was appointed professor of philosophy at Frankfurt-on-the-Oder, where he died, 1787.

**Baur, Ernst** (*bea'ernst*), **Karl Heinrich**, German physiologist, was born in Baden, 1708, and died at Berlin, 1886. From 1824 to 1860 he was professor of clinical medicine at Freiburg.

**Baur, Ferdinand Christian**, von, German theologian, born 1792, at Schmiden, near Stuttgart, was the founder of the Tubingen school of theology. In 1826 he turned to the writings of protestant theology at Tubingen, which he held until his death in 1860.

**Baur, Heinrich**, barrister-at-law, Middle Temple; author; born at Lexington, England, 1854; was educated privately in London and Germany. In 1882 he was elected to a professorship in conjunction with the late William Morris, and for some time co-edited with him the weekly London Standard. His chief works are: *Kant's Prolegomena*; *The Problem of Reality*; *Socialism, its Growth and Outcome*; *The Peasants' Revolt*; *On the History of Socialism*, *New and Old*; *The Roots of Reality*.

**Bayard** (*ba'ard*), **Pierre Du Terrail Chevalier De**, French statesman and writer, born at Paris, 1801. He served under Charles VIII., in an expedition against Naples, and in the wars against the English. He was distinguished by his courage, his bravery and nobleness of character. He was killed in a battle at the river Senna, Italy, in 1524. He has been called "the knight without fear and without reproach."

**Bayard, Thomas Francis**, American statesman, was born at Wilmington, Del., 1828. He was privately educated and began the practice of law in his native city in 1851; entered Cleveland's cabinet as secretary of state in the latter year. In 1893 was appointed ambassador to England, the first to hold that rank as a representative of the United States. Died 1908.

**Bayle** (*ba'le*), **Pierre**, French skeptic and critic, was born at Carlat, 1647. In 1675 was elected to the chair of philosophy at Sedan; in 1681 at Rotterdam. In 1684 he started *Nouvelles de la République des Lettres*. The revocation of the edict of Nantes led Bayle to write a able defense of toleration. He died in 1706.

**Basaine** (*ba'zen*), **Fraudeo Achille**, a marshal of France, was born at Versailles in 1811. He died himself in Algeria, the Crimea, and Mexico. Died at Madrid 1888.

**Basile, Louis**, saint, French socialist, born at Paris, 1791; in 1820 founded an association of French Carbonari, and in 1823 he was banished to the school of Saint-Simon. He died in 1832.

**Beach, Rex Killgusd**, author, playwright; born at Atwood, Mich., 1877; educated at Rollins College, Winter Park, Fla., 1891-96, Chicago College of Law, 1896-97. Author: *Pardners*; *The Spider*; *The Silver Sword*; etc.

**Beaconsfield**, **Earl of**, **See Disraeli**, **Benjamin**.

**Beard** (*ba'd*), **Joseph Henry Jr.**, lawyer, educator; born in Dorchester, Mass., 1801; graduated from Harvard Law School, 1822; studied in France; law school, 1828-92; teacher of law, Harvard law school since 1890, assistant professor of law, 1892-93. Author: *Principles of Law*; *On Criminal Law*; *On Damages*; *Cases on Carriage*; *Uninsured*; *Insured Risk Regulation*.

**Beatrice** (*bea'trice*), *bea'trice*, a Florentine noble, remarkably graceful and accomplished. Dated first seen by Dante in 1284, and thereafter in the middle and middle afterwards; but in his vivid imagination she grew to be the personification of divine truth, and so appeared in the *Divine Comedy*. In 1287 she married a citizen of Florence. Born in 1266; died 1290.

**Beattie** (*ba'tie*), **James**, Scottish poet and writer on philosophy, born at Laurencekirk, Scotland, 1735; died 1803. Principal of Glasgow philosophy. In Marischal College, Aberdeen, 1760-97. His name now rests almost wholly on *The Minstrel*, a descriptive poem written at the request of the Marquis of Bute, 1791.

**Beatty, John W.**, director of fine arts, Carnegie Institute, Pittsburgh, Pa., born at Pittsburgh, 1851; student of Munich Academy of Fine Arts; A. M., Western University, 1874; composer of music, and member of many art societies.

**Beaufort** (*bea'fort*), **Henry**, cardinal and bishop of Winchester, born 1411, died 1509. He was the king Henry IV. He was educated in England and Germany, and in 1405 became bishop of Winchester. He was a supporter of the young king, Henry VI., to France, to be crowned in Paris as king of France and England. Died 1447.

**Beaufort, Margaret**, countess of Richmond and Derby, was born 1441, died 1509. She was the daughter of the duke of Somerset, wife of the earl of Richmond (half-brother of Henry VI.), and by his mother of Henry VII. of England.

**Beauharnais** (*bea'har-nai*), **Eugene de**, viceroys of Italy during the reign of Napoleon I., and afterward duke of Leuchtenberg, and prince of Baden, born 1781, the son of the vicomte Beauharnais. After his mother's marriage with Bonaparte, he was married to the daughter of the king of Italy and in the expedition to Egypt; and in 1809, after the erection of the imperial throne, he was made viceroy of Italy. He was killed at the battle of the victory of Lützen was decided by his conduct in that battle. Died 1824.

**Beaucharnais, Henriette Eugene de**, daughter of Josephine, born in 1783; was married against her will to Louis, youngest brother of Napoleon Bonaparte, from whom she separated in 1810. Her son by him was the late Napoleon III. Died 1837.

**Beaucharnais** (*bea'har-nai*), **Pierre Augustin** Carot, French statesman, born at Paris, 1732; married a widow, Madame Franquet, 1776, and by her had a property which he took the aristocratic name of Beaucharnais. Meanwhile devoting himself to literature, he produced several plays, *Le Comte de Saxe*, *Ami, ou le Négociant de Lyon*; *Le Barbier de Séville*; and *Le Mariage de Figaro*. He died in 1799.

**Beaumont** (*bea'mont*), **John**, English dramatist, best known by his literary partnership with John Fletcher, was born at Grace Dieu, Gloucestershire, 1592. Died 1633.

**Beauregard** (*bea'ur-gard*), **Pierre Gustave Toutant**, general of the army of the Confederate States from April 1862 to April 1865, born at New Orleans, La., 1818. At the secession of Louisiana he resigned his commission in the regular army; in 1862 he was elected to the Louisiana legislature, and was named to the command at Charleston, S. C., where, on April 12-13th, he commenced the war by the bombardment of Fort Sumter. He was killed in the battle of Bull Run; after the war he became a railroad president, and in 1875 adjutant general of Louisiana. Died 1893.

**Bebel** (*be'bel*), **Ferdinand August**, German social democrat, was born at Cologne, 1840, and in 1860 removed to Leipzig, where in 1864 he established himself as a master turner. He is an effective speaker and writer.

**Beccaria** (*be'car-ia*), **Cesare, Marchese, di**, Italian economist and jurist, was born at Milan, 1738. In 1764 he published anonymously his work on *Crimes and Punishments*, in which he argued against capital punishment and torture. He was among the first to advocate the beneficial influence of education in lessening crime. In 1768 he was appointed professor of political philosophy at Milan; in 1791 he was made a senator of the empire. He died in 1820.

**Becher** (*be'cher*), **Joseph Joachim**, German chemist, was born at Spire in 1835, and lived successively at Mainz, Vienna, Munich, Würzburg, Haarlem, London, where he died, 1906. His *Physico-Chemistry* was the first attempt made to bring physics and chemistry into close relation.

**Beck, James M.**, lawyer, born at Philadelphia, Pa., 1801; graduate of Moravian college, Bethlehem, 1820; admitted to the bar in 1824. United States attorney for eastern district of Pennsylvania, 1836-1900; assistant attorney-general of United States, 1840-41; United States attorney by United States court, 1902, the *Philadelphia Record* for \$1,000,000—highest price ever brought by an American newspaper for the right to publish a law firm of Shearman & Sterling, New York, 1903, and removed to that city; also member law firm of Beck, McCallum & Co., New York.

**Becker, Wilhelm Adolf**, German author and physiologist, was born at Dresden in 1796, died 1845. He was admitted to the University of Leipzig in 1817 was appointed professor of archaeology at the University of Leipzig. His lively fancy, aided by a knowledge of the Greek and Latin languages, enabled him to make a novel use of antiquity. In his *Charities* he ventured to reproduce the appearance of the Greek goddess *Gaia* to give sketches of the Augustan age at Rome.





metics at Groningen. His forte was pure mathematics in which he had no superior in Europe in his day. He died in 1736.

**Berosus** (*ber'-e-us*), an eminent Babylonian historian, was born in the fourth century B. C.; was a priest in the temple of Bel and wrote, in Greek, upon history and astronomy.

**Bert** (*ber'*), **Paul**, French physiologist and republican anti-religiousist; born at Lyons, 1824; died in 1883, and died at Tongking, 1886. He was minister of public instruction in Gambetta's cabinet, 1881-1882.

**Berthelot** (*ber'-el'*), **Pierre Eugene Marcellin**, French chemist, was born at Paris, 1827, and in 1860 became professor of organic chemistry at the Ecole des Pharmacies; in 1865 in the Collège de France; in 1880 perpetual secretary of the Académie des Sciences. He had very important work in synthetic chemistry, and wrote a history of alchemy. He died in 1907.

**Berthier** (*ber'-tye'*), **Louis Alexandre**, prince of Neuchâtel and Wagram, and marshal of the French empire, was born at Versailles, 1753. He entered the army in 1770 and fought with Lafayette in the American revolutionary war. Berthier was Napoleon's proxy in the marriage of Maria Louise, at Vienna, 1810. In the campaigns of 1812, 1813, and 1814 he was constantly by the emperor's side, and acted both as chief of staff and as quartermaster-general.

**Bertilson** (*ber'-tyon*), **Alphonse**, French anthropologist; head of identification department in the police of Paris; born at Lyons, 1854; died in 1903; founded his system of monourism, known as the *Bertilson System*, in 1880. Author: *L'Anthropologie Moderne*, *Les Races Humaines*, *La Psychopneumologie*, *Le Système de Bertilson*, 1880.

**Berthel**, **James**, American educator, was born in 1870, at Moulins, France, and served with distinction in Hungary, Ireland, and Flanders. In 1900 he was elected to the presidency of the American Association for the Advancement of Science.

**Berzelius** (*ber'-el'-i-us*), **Johan Jakob**, Swedish chemist, was born at Westervik, in East Gothland, Sweden, 1779; died in 1848. He was a baron and senator of the kingdom. He was the author of what is known as the dualistic (or binary) theory of the chemical constitution of compounds, and devised the form of symbolic notation now employed. His reputation as world-wide, and his accurate investigations, gave him great influence on the development of scientific chemistry.

**Besant** (*be'-ant* or *be'-ant*), **Annie**, president British theosophical society; author and lecturer on religious, philosophical, and occult subjects; was born in London in 1847. Founded in 1890 the Central Hindu College at Benares; 1904, the Central Hindu College at Varanasi; and the University of India. Author: *Re-incarnation; The Wisdom of the Vedas*, etc.

**Besant** (*be'-ant*), **Sir Walter**, English novelist, was born at Portsmouth, England, 1836. He studied at King's College, London, and at Christ's College, Cambridge. His first novel, *John Galsworthy*, appeared in 1868. Sir Walter wrote also *All Sorts and Conditions of Men*, *An English Garden Fair*, *Dorothy Fothergill*, *Children of Gibeah*, *Armour of Loyalty*, *The Iron Gate*, *Beyond the Dreams of Avarice*; *The Master Craftsman*, etc. Knighted in 1895, he died in 1901.

**Bessel** (*be'-el*), **Friedrich Wilhelm**, German astronomer, was born at Minden, Prussia, 1784, died at Königsberg, 1846. He attracted the attention of Olbers by his computation of the orbit of the comet of 1807 from observation which had just been discovered; appointed director of the new observatory at Königsberg, where the bulk of his active life was spent; made many additions to the length of the seconds-pendulum and that of standards of length were of the highest importance.

**Besemer** (*be'-em-er*), **Sir Henry**, English engineer and inventor, born at Charlton, England, in 1813; of his many inventions the chief is the process named after him. He converted pig-iron into steel at once by blowing a blast of air through the iron while in fusion until everything extraneous is expelled, and only the definite quantity of carbon is left in combination. He was knighted in 1879, and died in 1898.

**Bessey**, **Charles Edwin**, scientist, professor of botany in the University of Nebraska since 1884; born on a farm in Milton, Ohio, 1843; graduated at Michigan Agricultural College, Ph. D., 1871; L. D., acting chancellor of University of Nebraska 1885-91, and 1899-1900; botanist editor of *American Naturalist*, 1880-97; author of *Higher School Botany*, *The Essentials of Botany*, *Botany of 1897*, *Higher School Botany*, etc.

**Bethmann-Hollweg** (*bet'-man-hol'-weg*), **Dr. Theodor**, von, statesman, philosopher, imperial chancellor of the German empire, and president of the Reichstag, born in Berlin, Prussia, in 1836; of Jewish lineage; educated at the University of Berlin, elected to the Reichstag in 1867, and imperial chancellor in succession to Prince von Bismarck, 1909.

**Benz** (*benz*), **Friedrich Ferdinand**, Count, German statesman, was born at Dresden in 1809. He devoted himself to politics and was employed by his government in different services in Berlin, Paris, and London. He was minister of foreign

affairs of the Austrian empire, and the present constitution was his work. He was Austrian ambassador at London, 1871-72. He died in 1891.

**Beveridge**, **Albert Jeremiah**, lawyer, writer, United States senator from Indiana, 1890-1911, born at New York, 1829; studied law at New York, 1850; read law in office of Senator McDonald, became managing clerk; admitted to bar in 1857; practiced law in New York; elected to the United States senate, 1890, and elected to the United States senate, 1899, and 1905.

**Bichard** (*bi'-chard*), **Charles**, French reformer, was born at Veslay, Burgundy, 1819, and studied Greek and law at Orleans. In 1859-59 was Greek consul at London. In 1860 he was appointed a theological professor and president of the Collège at Geneva; on Calvin's death the care of the Collège fell upon him. He died in 1871. He was sent by Comte on a mission to the court of the papistate. He died in 1865.

**Bichat** (*bi'-chut*), **Marie Francois Xavier**, celebrated French physician and anatomist, was born at Thoiry (Jura), 1771. He devoted himself to anatomy, physiology, and surgery; and established with several of his friends *La Société Médicale d'Émulation*, through the medium of which he gave to the world many highly original and important memoirs, notably those on the tissues of the human body. He was nominated physician of the Hôtel-Dieu in 1797, and died in 1802. His premature death being hastened in great part by his incessant labors, these three great works are the *Trésor des Mémoires*, *La Médecine*, and *Leçons de Médecine*. In 1816 he wrote the *Trésor d'Anatomie Générale*.

**Biddle**, **A. J. Drexel**, author, explorer, and lecturer born at Philadelphia, Pa., 1874. He was educated at the University of Pennsylvania, and at the University of California, Berkeley, 1895, and became its editor; head of publishing house of Drexel Biddle, New York, 1895-1904. Author: *A Dual Role*, *All Around Athletics*, *The Flowers of Life*, *The Modern Islands*, *The World of the Future*, etc.

**Biddle, John**, the founder of English Unitarianism, born in 1616, at Wotton-under-Edge, in Gloucestershire, died in 1682. He was a Unitarian, and suffered for his creed, and even the protector himself, in order to save his life, was compelled to baptize him one of the basty lads. Died in 1662.

**Biddle, Nicholas**, American commander, was born at Pa., 1758. He was a member of the revolutionary war. During the action of his ship, the *Revenge*, with the British ship, the *Columbia*, in 1782, the former was blown up and he was killed.

**Biele** (*bi'-el*), **Wilhelm von**, German astronomer and physicist, was born at Berlin, 1792, died in 1872. He is chiefly noted for his discovery, in 1826, of the comet named for him. **Biele, Albert**, author, journalist; born in Ohio in 1842; served as line officer during civil war; breasted many for distinguished services; went to London in 1867, went to London, 1872, contributing to *Pan* fables, purporting to be translations from Zambri, the Parise, afterward published under the name of an Empty Skull; author of numerous sketches, essays and studies.

**Bierstadt** (*bi'-stad*), **Albert**, landscape painter; born near Düsseldorf, Germany, 1830. Came in infancy to New Bedford, Mass., and married; studied four years in Europe, 1853-57; made repeated visits to the West and to Europe; specialty in pictures of scenes in Rocky Mountains, Sierra, and Switzerland. Died 1902.

**Bigelow**, **John**, author and diplomat, was born at Malden, N. Y., 1817; graduated from Union College, 1835; LL. D., Union and Ruine College, 1840; LL. D., Union College, 1840. He was a member to bar; one of the editors *New York Evening Post*, 1841-45; consul at Paris, France, 1851-64; secretary of the Legation of the United States at Vienna, 1864-67; author of *Hereditary Monarchy*; *Writings and Speeches of Samuel J. May*; *The Life of Benjamin Franklin*, etc. He died in 1891. **Bigelow, John**, born at Boston University law school; born at Eaton Rapids, Mich., 1846; graduated from University of Michigan, 1866, LL. D., Northwestern University, 1896. Author: *The Law of Botany*; *Leading Cases in the Law of Tort*; *The Law of Bills*, *Notes and Cases*; *The Law of Wills*.

**Bigelow, Poutney**, author, journalist; born in New York, 1819; graduated from Yale, 1839; Columbia law school, 1842; admitted to New York bar, 1842; was correspondent for *London Times* during the Crimean War; author of *The German Emperor and his Neighbors*; *Poodles and Politics*; *Down the Danube*; *White Man's Africa*; *The Story of the Nations*, etc.

**Billing, John Shaw**, surgeon, librarian; was born in Switzerland county, Indiana, 1849; graduated from the University of Michigan, 1871; LL. D., D. C. of Oxford, 1880, served in army, 1871-72, surgeon and surgeon, reaching rank of lieutenant-colonel and deputy surgeon; later medical professor at the University of Pennsylvania, 1903-96; since 1906 director New York public library, Astor, Lenox and Tilden foundations; Librarian of the Carnegie Institution, Washington. Author: *Principles of Ventilation and Heating*; *National Medical Dictionary*; and many other works.

**"Blinets, Josh."** See **Bhav, Henry W.** **"Blinets, (bi'-el), Alfred**, French physiologist; born in Lyons, 1827; died in 1897. He was editor of *Année Psychologique*, and director of the psychological laboratory at the Sorbonne, Paris. His work included many studies in physiological psychology.

**Blinns, Charles Fernus**, educator and writer on ceramics; born at Worcester, Mass., 1852; graduated King's Scholar, 1870; studied analytical chemistry, Birmingham, England, and decorative painting, 1871-72; worked in the pottery works, Worcester, England, 1872; superintended successfully chemical laboratory, department of painting, London; spent of sales, department of clay working and pottery; principal technical editor of science and art, Trenton, N. J., 1897-1900; director New York state college of pottery and ceramics since 1900. President American Ceramic society, 1901. Author: *Ceramic Technology*, *The Story of the Pottery*, *The Pottery Craft*, etc.

**Blot** (*blot'* or *blot'*), **Jean Baptiste**, French astronomer, optician, and natural philosopher, was born at Paris, 1774. He is especially celebrated for his researches in the circular polarization of light, and in 1802.

**Birrell** (*ber'-el*), **Mr. Hon. Augustine**, chief secretary to the Lord Lieutenant of Ireland since 1907; born at Liverpool, 1820; graduated at Cambridge, 1872; LL. D., St. Andrews; barrister, 1875; teacher law, 1876; New York state college of pottery and ceramics since 1900. President American Ceramic society, 1901. Author: *Ceramic Technology*, *The Story of the Pottery*, *The Pottery Craft*, etc.

**Bismarck**, **Otto**, German statesman, was born at Lüneburg, 1815; early devoted himself to composition of dramatic music, and in 1840 produced *Die Germanen*, which was a great success. In 1840 his last dramatic piece, *The Germanen*, was produced at the Garden Theatre in honor of the queen of Prussia. He was knighted; and in 1848 became professor of music at the University of Berlin.

**Bismarck-Schonhausen** (*bi'-mark-shen'-hausen*), **Otto Eduard Leopold**, Prince, born of a noble family, at Schonhausen, April 1, 1815; studied at Göttingen, Berlin, and Grewald; entered the army and became lieutenant in the Landwehr. After a brief interval devoted to his estates and to the office of inspector of dikes, he became in 1846 a member of the provincial diet of Saxony, and in 1847 of the Prussian diet.

In 1851 he was appointed representative of Prussia in the diet of the German federation at Frankfurt, where with brief interruptions he remained till 1859. He was distinguished by ability in his efforts to checkmate Austria and place Prussia at the head of the German states. From 1859-62 he was ambassador at St. Petersburg. In 1862 he was appointed ambassador to Paris for five months' duration, became first minister of the Prussian crown.

The lower house persistently refusing to pass the bill for the reorganization of the army, Bismarck at once dissolved it (October, 1862), closing it for four successive sessions until the work of reorganization was complete. When popular feeling had reached its most strained point the Schleswig-Holstein question acted as a diversion, and Bismarck—by the skillful manner in which he added the duchies to Prussian territory, checkmated Austria, and excluded her from the German confederation, which Prussia had been unable to do, became the most popular man in Germany.

As chancellor and president of the federal council he secured the neutralization of Luxembourg in 1867, and the annexation of Alsace and Lorraine to France, and though in 1868 he withdrew for a few months into private life, he resumed office before the close of the year. A struggle between Germany and France appearing to be sooner or later inevitable, Bismarck, having made full preparations, brought matters to a head on the question of the Hohenzollern candidature for the Spanish throne. Having carried out his purpose, he resigned his office as chancellor and prince of the new German empire. Subsequently, in 1872, he alienated the Roman Catholic party by promoting adverse legal action against monastic orders. He then resigned his position for a year, though still continuing to advise the emperor. Towards the close of 1873 he returned to power retaining his position until, in March, 1878, he was again elected and tendered his resignation. In 1878 he presided at the Berlin Congress, in 1880 at the Berlin Conference, and in 1884 at the Congo Conference. He was elected to the Reichstag at Berlin in 1866, and at Kissingen in 1874. He died July 31, 1898.









**Bonnard, de (dè bôn'ân')**, François, French historian and hero of Byron's *Prisoner of Chillon*; was born near Geneva, 1490; educated at Turin, where he became private secretary to the duke in 1510, at the age of fourteen years. Having fallen into the hands of robbers who delivered him into the power of the duke of Savoy, he was imprisoned in 1530 in the castle of Chillon. The Geneva aided by the Bernese effected his liberation in 1536.

**Boone, Daniel**, American hunter and pioneer, was born in Bucks county, Penn., 1733. The boy had no formal education, but was a good hunter and an Indian life. When thirty-four years old he went with five others into the wilds of Kentucky. He was first sent on the Kentucky river, and named Booneborough. The Indians attacked the fort several times, but were driven off. He continued to live there until 1792, then went to Missouri, where he died in 1820.

**Booth, Ballington**, general-in-chief and president Volunteers of America, was born at Bridgeport, England, 1839; son of Rev. William and Catherine Ballington. Commander Salvation Army, Australia, 1885-87; United States, 1887-90; founded 1896, the Volunteers of America, Ordained presbyter, Chicago, 1896. Writer, public speaker, philanthropist.

**Booth, Edwin Thomas**, American actor, son of John Brutus Booth, was born in Baltimore, Md., 1833, appearing first on the stage in 1848 in *Richard III*. He steadily rose in his profession, visited England and the continent of Europe in 1851, 1853, and 1855, and met with great success in his recitations. He opened Booth's theater in New York, 1860, and did more than any other individual to give the tone dramatic art up to a moral and literary standard. Died, 1893.

**Booth, Junius Brutus**, actor, was born in England in 1803, first appearing on the stage in 1818 in *the Honeymoon*, and within four years became famous in London as *Richard III*. His American tour was as a triumph.

**Booth, Maud Ballington** (née Charlesworth), wife of Ballington Booth, general-in-chief, Volunteers of America. Author: *Peter Pan*; *The Curlew*; *The Curse of Septic Shoal Treatment*; *Twilight Tales*.

**Booth, Tracker, Frederic St. George de Lantour**, commander of Salvation Army in the United States; was born at Monaghan, Bengal, India, 1848; inaugurated Salvation Army in America in 1882; had charge there until 1891; secretary for international work, Salvation Army, London, 1891-1900; since March, 1900, in charge of the States; married in 1888 Emma Moss, daughter of General William Booth, of Salvation Army. Name of Booth-Booth, *Life of General William Booth*; *In Darkest India and the Way Out*.

**Booth, William**, general and commander-in-chief of Salvation Army; was born in Nottingham, England, 1829; became a minister of the Methodist Episcopal church in 1852; in 1854 he married the Christian mission in the densely populated east end of London. Out of this grew the Salvation Army, whose manifestations spread throughout the world. He is the author of *Orders and Regulations for Officers and Soldiers*; *Letters to my Soldiers*. Publications: newspapers entitled *War Cry*, *Youth Soldier*, *Social Gazette*, etc.

**Bopp (bop)**, Franz, celebrated German philologist and Sanskrit scholar, was born at Mainz, 1791; was professor of oriental literature and general philology at Berlin. He was in 1842 made a knight of the newly created French Order de Mérite, and in 1857 foreign associate of the French institute. Died, 1867.

**Bora, William Edgar**, lawyer, United States senator, was born in 1855, in Wayne county, Ill.; educated at the Southern Illinois academy, and the Kansas State University; married in 1881; was admitted to practice law in 1880 at Lyons, Kan., and devoted his entire time since then exclusively to practicing law. He was elected to the United States senate in 1907.

**Borden, Sir Frederick William**, Canadian minister of militia and defense, was born at Amherst, N. S., 1847; King's College, Windsor, Nova Scotia, B. A.; Harvard, M. D.; appointed assistant surgeon 1864; settled in King's county, N. S., 1866; new surgeon lieutenant-colonel and hon. colonel of Canadian army medical corps; first elected to office of commander 1874; President of the Association made riding continuously.

**Borden, Robert Laird**, lawyer, legislator, was born at Grand Pré, Nova Scotia, 1839; studied at Amherst College, Amherst, Boston. Began the study of law, 1874; admitted to bar, 1878; Q. C., President of Nova Scotia bar, 1890; member 1893-1904; Hon. D. C. L. L. D., 1905; member for the city and county of Halifax, 1896-1900; in 1901 upon the resignation of Sir Charles Tupper he was elected leader of conservative party in the Dominion house of commons.

**Bore, William Chas.**, surgeon, educator; was born at Watertown, N. Y., 1858; graduated medical department Columbian University, Washington, 1885; appointed assistant surgeon, U. S. A., 1885; major and chief surgeon, 1898; during Spanish-American war, commanded the first general hospital, Kansas City, Mo.; medical department Washington University, (36)

ly. Author: *Use of the Roentgen Ray by the Medical Department of the United States in the War* 1915.

**Borghese (bôr-gê-sê')**, Marie Pauline, princess, originally Bonaparte, sister of Napoleon, was born in 1780, at Ajaccio. With Napoleon, who was her husband, she had many children, many reconciliations. Before the battle of Waterloo she placed all her diamonds, which were of great value, in his disposal, and they were in a carriage, which was taken in that battle, and exhibited in London. She died at Florence in 1846.

**Borgia (bôr'djâ)**, Cesare, Italian master of statecraft of great but evil fame, was born in 1476, the fourth son of Pope Alexander VI., by a mistress. He commenced the death of his brother, Giovanni, who was the duke of Candia, in order to gain complete ascendancy in the papal government, and in 1498, having been sent as ambassador to Louis XII. of France, he was created duke of Valentinois and married the daughter of Jean d'Albret, king of Navarre. He was sent in 1504 a prisoner to Spain by Pope Julius II., but escaped and joined the king of Navarre's army against Castile. In this campaign he was killed in 1507.

**Borgia, Lucretia**, sister of the preceding, and like him the possessor of an infamous reputation, was born in 1480. Her father married her twice to marriage and divorce before she became the wife of the duke of Biargia. After her husband's death she married her brother, Giovanni, she married Alfonso of Este, and passed her life in the court of Ferrara, cultivating literature. Died, 1519.

**Borgin, John Cutson de la Mothe** ("Gutson, Borgin"), sculptor, painter, born in Idaho, 1877; studied art in San Francisco; went to Paris, 1898. Exhibited as painter and sculptor in the salon; settled in New York since 1902. Exhibited in London and Paris, 1899-1901.

**Borgin, Solon Randolph**, sculptor, was born at Ogden, Utah, 1868; pupil in Cincinnati art school and under Louis Roubou and Fremet, Paris; home-coming exhibition, 1894; won gold medal, Exposition Universelle, Paris, 1900; silver medal, Buffalo exposition, 1901; gold medal, St. Louis exposition, 1904; member national sculpture society.

**Borromeo (bôr-rô-mê')**, Carlo, Count, cardinal and archbishop of the Roman Catholic church, was born in 1538, of great influence. He was the great uncle of Pope Pius IV. was born at the castle of Arona, on the Lago Maggiore, northern Italy, whence he was expelled by the emperor Charles V. to his being exiled thirty years after his death. Several memoirs of him have been published. Died, 1601.

**Borrow, George**, English author and traveler, was born in Norton, in 1817. He made the gipsy one of his principal subjects. His best and his first important work was *The Zincali*, or *An Account of the Gipsies of Spain*. Died, 1881.

**Boswell (bôs-wel')**, James, a Scotch lawyer, Fellow of University College, Oxford, M. A. L. D.; born at Ayrwick, England, 1740; Balliol College, Oxford, 1757-61; professor of moral philosophy, St. Andrews, 1805-08. Author: *Logic*; *Methodology of Knowledge*; *History of Scotchmen*; *Philosophical Theory of the State*, etc.

**Boscawen (bôs-ka-wen')**, Edward, the admiral "Old Dreadnought," was born in Cornwall, England, 1711, the son of Viscount Falmouth. In 1755 he intercepted the French fleet off Newfoundland, capturing two 64-gun ships and 1,600 men. Boscawen crowned a long and victorious career by his signal victory over the French Toulon fleet in 1759. He was knighted in 1760, and in 1761, of parliament, a pension of 3,000 pounds a year, a seat in the privy council, and the command of the fleet. He died at his Surrey seat, Hatfield Park, 1761.

**Bosquet (bôs-sê')**, Jacques Bénigne, a distinguished French statesman, was born at Paris, 1733. He was the author of several controversial works, all in defense of the Revolution. He was killed by his own sword chiefly on his sermons. Died, 1794.

**Boswell, James**, the biographer of Johnson, was born in Scotland, 1733, and came to England on a visit to London in 1763, and conceived for him the most devoted regard; made a tour with him, 1763-64, and returned to London, 1766; he afterward published; settled in London, and was called to the English bar; succeeded, in 1782, to the father's estate. He arricché the *Ayres*, with an income of 1,600 pounds a year. Boswell's *Life* appeared five years after Johnson's death.

**Bosworth, Joseph**, Anglo-Saxon scholar, was born at Derbyshire in 1780, and died at Oxford in 1842. He was professor of Anglo-Saxon there from 1855. His chief works were *Elements of Anglo-Saxon Grammar* and *An Anglo-Saxon Dictionary*.

**Botha (bô'th)**, Sir. Hon. Louis, Boer soldier, statesman, born in 1863 at Greytown in Natal, a member of the Volksraad, Transvaal, elected, succeeded Joubert as commander-in-chief of the Boer forces during the war, and in 1907 became Prime minister of the Transvaal colony under the new constitution.

**Botta (bôt'tâ)**, Carlo Giuseppe Guglielmo, Italian historian, was born in 1766; studied medicine, and was imprisoned in 1792 as a revolutionary. He wrote *History of Sicily* in 1793 and 1794, and a *History of the American War of Independence*. Died, 1837.

**Botta, Paul Emile**, French archaeologist and traveler, son of preceding, was born in 1802. In 1830 he went to Egypt, where he entered into the service of the French consul, and in 1832 he went to Alexandria he was sent as consular agent to Mosul, where he commenced a series of discoveries which formed a series in archaeology and science. He returned to France in 1868, and died at Athens in 1870.

**Botticelli (bôt-tich'el-lî)**, Alessandro, Italian painter, was born in 1437. In response to the invitation of Pope Sixtus IV. he went to Rome and executed some paintings for the Vatican of the Vatican. On returning to Florence he became a devoted follower of Savonarola. Died, 1510.

**Bougainville (bô-gân-veil')**, Louis Antoine de, French navigator, was born in Paris, 1732. In 1754 he went as secretary of the French embassy to London. He took a voyage round the world with a frigate and a St. Miel transport, the first which the French ever accomplished, which he described in his *Voyage autour du monde*. Died, 1814.

**Bouillon (bô-yôn')**, George Henry, artist, was born in England, 1834, and brought to the United States when three years old. He studied in New York, Paris, and Rome, and was a member of the National Academy of New York and an associate of the Royal Academy after 1879. Died, 1908.

**Bouqueran (bô-gû-rân')**, William Adolphe, French painter, was born at La Rochelle in 1825. In 1850 he gained the grand prize of the Académie des Beaux-Arts, and went to Rome to study. From that time his reputation was made. He painted some portraits, but his subjects are chiefly religious. He was a member of the Académie des Beaux-Arts in 1870. Died, 1908.

**Bouillon (bô-yôn')**, Godfrey de, duke of lower Lorraine; was born about 1061. He gained distinction in the armies of the emperor Heinrich IV., and was the great leader of the first crusade, and was unanimously proclaimed king of Jerusalem on its capture in 1099, but declined the title. He died in 1100, and was buried at Jerusalem. His virtues are extolled in Tasso's *Jerusalem Delivered*.

**Boule (bô-lâ')**, Ernest Jean Marie, French general and politician, was born in 1837; made colonel during the siege of Paris, general in 1870, and minister of war in 1871. In 1886. A threat of prosecution drove him into exile, and he committed suicide at Brussels. Died, 1891.

**Boulger (bô-jêr')**, Demetrius Charles, British historian and writer, was born in London 1853; educated at King's College, London, and at private tuition. Has contributed to all the leading journals on questions connected with the history, literature, and politics of Turkey since 1870; has also closely studied military questions, especially those connected with the French frontiers and the position of Belgium.

**Boulton (bô-lôn')**, Matthew, English mechanician, born in 1728 at Birmingham. He founded the famous Birmingham and steel plant near Birmingham. Died, 1806.

**Bourbaki (bôr-bâ-kî')**, Charles Denis Sauter, French general, born at Paris, 1816, fought in the Crimea and Italy. In 1870 he commanded the imperial guard at Metz, and after Garibaldi organized the army of the north, and commanded the army of the Loire. He retired in 1881 and died in 1891.

**Bourbon (bôr-bôn')**, Charles, French general known as the comte de Bourbon; was born 1800; for his services in the Russian campaign in 1815 he was made comte de France. With George of Prussia he led the mixed army of Spain and Germany to the Crimea, and plundered Rome in 1827. Bourbon was struck down in the fierce struggle by a bullet, and died in 1830.

**Bourdaine (bôr-dâ-nê')**, Louis, great French preacher, was born at Bourges, 1632, where, after being ordained, he became a Jesuit. He was lectured in the academy for some time on humanity, theological studies, etc. His sermons, based chiefly on the works of Irenæus, Tertullian, St. Augustine, were marked by profound moral earnestness and great logical power. His later years were spent in the study of the sciences and practice of charity. He died at Paris in 1704.

**Bourdon (bôr-dôn')**, Sébastien, French painter; was born in 1805 at Lyons, and died at Paris in 1853. In 1853-54 he was court painter in Sweden.

**Bourget (bôr-gê')**, Paul, French poet, critic, and novelist, member of the Académie Française. Was born at Amiens, 1852. He has written many eminently realistic and analytical books, chiefly studies of the social and political conditions of the age. Among them are the following: *Compagnie*; *Peinture de l'homme*; *Impressions of America*.

**Bourinet (bôr-rî-nê')**, Sir John George, Canadian author and publicist, was born at Sydney, Nova Scotia, in 1837; educated at Trinity col-

lege, Toronto; established the *Halifax Reporter*, and in 1880 became clerk of the Dominion house of commons. Among his works are *How Canada is Governed*; *Constitutional History of Canada*; *Parliamentary Practice and Procedure*. Died 1902.

**Bourne, Jonathan, Jr.**, lawyer. United States senator. He was born at New Bedford, Mass., 1855; entered Harvard College in 1873 and remained until the end of his junior year. He became largely interested in the mining interests of the Northwest; is president of a number of Oregon corporations and of the Bourne cotton mills at Fall River, Mass.

**Bradock, Edward**, British major-general, was born in 1693; commander against the French in America in 1755; with a force of 2,000 British regulars and provincials, he moved forward to invest Fort du Quesne, now Pittsburg, Pa.; his

troops fell into an ambush of Indians, while they were attacked in the front by the French, and half of them slain, among the mortally wounded being Braddock.

**rant, Joseph**, Indian chief of the Mohawk nation, was born in Ohio about 1742; held a commission in the British service, and fought against the American colonists in the revolution. He died in 1837.

educated for the church of Scotland, but undertook the editorship of the *Edinburgh Encyclopedia*. In 1819 the royal society awarded him the Rumford gold and silver medals for his discoveries on the polarisation of light; in 1832 he was knighted, and had a pension conferred upon him; in

1849 he was elected one of the eight foreign associates of the French Institute, the highest scientific distinction in Europe. In 1859 he was chosen vice-chancellor of Edinburgh University, 1860-66.

**Brian Borlino** (br'ān hō-ri'no), or **Brian Bor** (bō-rō), king of Ireland, was born 920; ascended the throne in 933. He was a powerful warrior, and became supreme ruler of Ireland. He defeated the Danes in upward of twenty pitched battles, and the battle of Clontarf, in which he was killed, he gained a signal victory over a united army of revolted natives and Danes.

**Bright, Duke of Devonshire** (brī't), styled the "father of British inland navigation," was born in 1736, died in 1803. In 1756-60 he obtained an act of parliament for making a navigable canal from Worsley to Salford, Lancashire. He was also a liberal promoter of the grand trunk navigation, and the impulse he thus gave to the internal navigation of England led to the extension of the canal system throughout the kingdom.

**Brightman, Frederick Arthur**, artist; was born at Tuskegee, Ala., 1817; apprentice in engraving department American bank note company, New York, 1864-65; knight legion of honor, 1878; officer order of St. Michael of Bavaria. Author: *Walters in Algeria; Anarchy in Art; The Ideal and the Ideal*.

**Briggs, Charles Augustus**, clergyman, theologian and author in New York, studied at the University of Virginia, 1857-60; Union theological seminary, 1861-63. Editor *Presbyterian Review*, 1863-64; was twice elected Moderator of the presbytery of New York, 1892, but suspended by general assembly, 1893; ordained presby. of Protestant Episcopal church, 1894. Author: *Biblical Study; American Presbyterianism; Messianic Prophecy*; *Walters*, etc.

**Briggs, Dr. Enoch**, educator; was born at Salem, Mass., 1855; graduated from Harvard, 1875; A. M., 1882; hon. LL. D., Harvard, 1900; Western Reserve, 1902; returned and returned, 1888, 1889-90, professor English since 1890, dean of college, 1891-1902, dean faculty of arts and sciences since 1902. Royalties from lectures and oratory since 1904. Harvard; president Radcliffe College since 1903. Has edited and annotated a number of English texts.

**Bright, John**, eminent orator and radical statesman, was born of Quaker parents, 1811; entered the ministry for Durham, being elected returned from Manchester, and losing that seat through his opposition to the Crimean war. He joined the Independent government, and was elected to the Irish church, but opposed his home rule policy in 1866. Died, 1869.

**Bright, Michael**, English physician, was born 1780, died 1858; educated at Edinburgh; practiced with great success in London. His specialty was the anatomy of the human system, and he was the first to describe the morbid symptoms and alterations of structure of the internal organs. His publications on this subject were made in 1802.

**Brinton, Daniel Garrison**, American ethnologist, was born at Thornbury, Pa., 1837, and died at New York City, 1900. He was educated at Yale in 1858, and from Jefferson Medical College in 1861. In 1865 he settled in Philadelphia. There he undertook for a time the professorship of ethnology in the academy of natural sciences, and in 1886 was professor of American linguistics in the University of Pennsylvania.

**Brisbane, Arthur**, editor and writer on present day topics; was born at Buffalo, N. Y., 1864; educated American public schools, and five years in France and Germany. Began newspaper work in 1883; seven years on New York World and its successor of different editions, 1891-97; editor New York Evening Journal.

**Bristol, Frank Milton**, Methodist Episcopal minister, was born at New York, 1836, and was elected Northwestern University, Ph. B., 1877; A. M., D. D.; five times member general conference Methodist Episcopal church, and was elected bishop. Author: *Prophetic Epochs; The Ministry of Art*, etc.

**Bristow, Joseph Little**, journalist, United States senator, was born in Wolfe county, Ky., 1861; graduated from Baker University, Kansas, 1886; United States secretary of commerce, 1891-95; 1895-97; fourth assistant postmaster-general, 1897-1905; had charge of investigation of Cuban frauds and reorganization of Cuban postal service, 1900. Appointed by the president special Panama railroad commissioner in 1905; United States secretary of commerce, 1906-1909.

**Brock, Sir Isaac**, British officer, was born in Guernsey in 1768. In the war of 1812, when an American general, under General Hull, invaded Canada, the Americans surrendered without striking a blow. He was killed in the battle of Queenstown, 1812.

**Brochhaus (brok'-haus), Friedrich Arnold**, founder of the famous publishing firm of Brochhaus in Leipzig and original publisher of the *Concise German-Latin Dictionary*, was born at Dortmund in 1772; from 1811 to 1817 he carried on business in Altenburg and finally moved to Leipzig, where he died, 1823.

**Brodeur, Hon. Louis Philippe**, Canadian statesman, minister of justice, was born at Beloeil, in the province of Quebec, 1860; educated

at the college of St. Hyacinth; LL. D., K. C., 1899; deputy-speaker of the house of commons, 1900-06; speaker, 1900-04; minister of inland revenue, 1904-06; member of the imperial conference; conference who negotiated the Franco-Canadian treaty of 1907.

**Bronte (brō'tē), Charlotte**, English authoress, was born at Thornton, Yorkshire, 1816. After a Franco-experience as a governess she engaged with her sisters in the writing of novels, and in 1846 published her first, *Jane Eyre*. After the Franco-experience she published the well-known story, *Jane Eyre*. Her second story, *Shirley*, was published in 1849, and her third, *Villette*, in 1853. In 1854 she married Rev. Mr. Nicholls, but soon after her marriage died of consumption.

**Brown, Augustus**, English Unitarian preacher and man of letters, was born near Dublin, 1832; educated at Trinity College and received degrees of M. A. and LL. B. in 1874 appointed chaplain in ordinary to the queen. Has published *Life and Letters of Frederick W. Robertson; The English Poet; A History of the English Literature; Study of Tennyson*; etc.

**Brooks, Phillips**, preacher and orator, was born at Boston, Mass., 1805; graduated from Harvard, 1835; 1870-91 rector of Trinity church, Boston; from 1891 to 1896, bishop of Massachusetts. His freedom from the ordinary sectarian trammels, his liberal views of doctrine, with his profound, earnest, and deeply spiritual, yet intensely practical preaching gave him great popular power. He died in 1893. His chief works are *Brooks on the Bible*, and *Brooks and Vaux*, British jurist, philosopher, and statesman, was born at Edinburgh, 1770. Elizabeth, queen of England, and her husband, George IV., acquired high reputation as an advocate. In 1810 he entered parliament, where he became a leader with liberal views. He was the acknowledged champion of parliamentary reform, was called to the house of peers, and in 1824, Macrae and Helen, a daughter, to which office he resigned in 1824. He devoted the remainder of his life almost exclusively to science and literature at his chateau at Cannes, France, Died, 1868.

**Brown, Calvin Smith**, university professor, was born at Tennessee, studied at the University of Paris and Leipzig, 1891-93; Ph. D., University of Colorado, 1894; Ph. D., University of Chicago, 1895. Professor of English, comparative literature, modern languages, Vanderbilt University, 1895-1900; University of Chicago, 1900-1905. 1880-1905; professor Romance language, 1905-9, acting professor German language and literature 1905-1909. University of Chicago, 1909-1910. Editor: *Tennyson's Enock Andra* and the two *Lockley Hall poems; The Later Shakespeare*, etc.

**Brown, Charles**, educator, was born at Philadelphia, Pa., 1871, and died there in 1910. His two best known stories are *Hiseloid*, and *Andra*.

**Brown, Elmer Ellsworth**, educator, United States commissioner of education; was born at Kingston, New York, 1859; graduated from the University of Illinois State Normal University, 1881; University of Michigan, 1889; Ph. D., University of Michigan, 1890; Ph. D., University of Chicago, 1893; professor same, 1893-1905; United States commissioner of education since 1906.

**Brown, Francis**, educator, was born in 1840; Davenport professor of Hebrew and the cognate languages. Union theological seminary, 1860-61; since 1900; president of the faculty. Union theological seminary, since 1908. Author of *Agriography; Its Use and Abuse*; also many articles on references.

**Brown, Henry Billings**, jurist, associate justice of the supreme court, was born at New York, 1806; born at South Lee, Mass., 1836; graduated Yale, 1856; LL. D., Yale, 1891; United States senator, 1861-69; 1873-75; 1879-81; 1885-89; resigned from United States supreme court bench, 1900. Compiler of *Brown's Admiralty Reports*.

**Brown, Henry Kirke**, American sculptor and painter, great variety; author of the colossal statue of General Washington in Union square, New York; *The Angel of the Resurrection*, in Green-wich cemetery, Brooklyn, and others. He was born in 1814, died 1886.

**Brown, John**, leader of the Harper's Ferry insurgents, designed to lead the rebellion in the southern states to rebellion; was born at Torrington, Conn., in 1800. In 1845 he went to Iowa, where he was elected to the legislature, that state was settled by a general vote, he traveled through the southern and eastern states, declaiming in secret, and eventually he was to organize an armed attack upon it. In 1859, at the head of seventeen white men and five blacks, he commenced a great variety of hostilities by a revolt upon Harper's Ferry. Instead of retreating to the mountains, he was taken hostage, as he was, and was held in Brown's inn in town until exchanged, by which time 1,000 militiamen had arrived. He was captured, tried for treason, and hanged in 1859.

**Brown, Norris**, lawyer, United States senator, was born in 1863, at Naquakota, Iowa; graduated from the University of Iowa, 1885; LL. B., 1887; was later received the degree of M. A.; admitted to practice law in Iowa, 1885; moved to Keosauqua,

Iowa, 1888; attorney-general, 1904-06, was elected to the United States senate for the term 1907-13.

**Browne, Charles Farrar**, American humorist and merriment, known by the pseudonym of "Artemus Ward," was born at New York, 1824. He traveled over America lecturing, carrying with him a whimsical panorama as affording topics for his humorous and frolicsome lectures. He died in England in 1867.

**Brown, Sir Thomas**, English physician and author was born at London in 1605. During the civil war and the protectorate he remained in learned seclusion, indifferent to worldly honors. He was knighted in 1671, and died on his bed in 1682. His chief works are *Reliquie Medice*; and *Prælectiones*.

**Browning, Elizabeth Barrett**, English poetess, was born at London in 1806, died at Florence, Italy, 1861. In 1846 she married Robert Browning. In 1850 Mrs. Browning published her collected works, together with several new poems. *Aurora Leigh*, her longest production, was published in 1850.

*Poems before the Congress* appeared in 1860. **Browning, Oscar**, English historian and critic, was born at London, 1837; educated at Eton, King's College, Cambridge; master at Eton, 1860-75; college and university work at Cambridge since 1876.

**Browning, Robert**, British poet, born at Camberwell, May 7, 1812; died Dec. 12, 1869. After completing his education at the University College, London, he went to Italy, where he made diligent study of its mediæval history and the life of the people. In 1846 he married Elizabeth Barrett Browning, who came to Italy, making occasional visits to England.

His first poem, *Pauline*, was published in 1833; followed by *Paracelsus* in 1835; *Strafford, a Tragedy* (1837), produced at Covent Garden, Macrae and Helen, a daughter, to which office he resigned in 1824. He devoted the remainder of his life almost exclusively to science and literature at his chateau at Cannes, France, Died, 1868.

**Brown, Calvin Smith**, university professor, was born at Tennessee, studied at the University of Paris and Leipzig, 1891-93; Ph. D., University of Colorado, 1894; Ph. D., University of Chicago, 1895. Professor of English, comparative literature, modern languages, Vanderbilt University, 1895-1900; University of Chicago, 1900-1905. 1880-1905; professor Romance language, 1905-9, acting professor German language and literature 1905-1909. University of Chicago, 1909-1910. Editor: *Tennyson's Enock Andra* and the two *Lockley Hall poems; The Later Shakespeare*, etc.

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lensed a minister of the Baptist church, 1857; became a pastor at Los Angeles in 1859, when he was incapacitated by an accident. He is the author of *Hawkeyesmen; Chances from a Jesuit's Study* (London, 1861).

**Burdick, Francis Marion**, lawyer, educator, Dwight professor law, Columbia University, since 1901; member of the Faculty for Social Science, Hamilton College, 1869; LL. D.; professor law and history, Hamilton College, 1882-87; practitioner law, Cornell University, 1887-91; 1887-91. Mayor of Utica, 1882-83. Author: *The Essentials of Business Law; Cases on Torts; The Sales; Insurance*.

**Burgess, Frank Gesselt**, writer, illustrator; born Boston, 1866; graduated at Massachusetts Institute of Technology, B. S., 1887; graduated from Southern Pacific railway, 1887-90; instructor topographical drawing, University of California, 1891-92; designer, 1894-95; writer various magazines in New York, 1897-98; removed to London, 1898, to San Francisco, 1900, to Boston, 1904; associate editor *Esquire*, 1906. Author: *Vivette; The Lovely City Girls; Goops and How to Be Them; A Gape of Teeth; Burgess Novels Book*.

**Burgess, John William**, educator; born in Connersville, Tenn., 1841; attended Cumberland University, Lebanon, Tenn.; graduate of Andrews, 1867; admitted to bar, Springfield, Mass., 1868. Professor political science and constitutional law since 1870, then dean faculty of political science since 1900, Columbia University; Roosevelt professor of American history and institutions, University of Berlin, 1900-07. Author: *The Science and Comparative Constitutional Law; The Period; The Civil War; Reconstruction; Reconstruction and the Constitution*.

**Burkney (bur-ney)**, John, British general, was born 1722; entered the army; and in 1762 displayed much talent and courage in command of a party of the British in the Florida. In the American war, he and the army which was to penetrate into Canada into the revolting provinces. At first, he was successful; but was ultimately compelled to surrender at Saratoga, 1777. He died in 1792.

**Burke, Edmund**, British statesman and orator, was born at Dublin, about 1730; graduated at Trinity College, Dublin, 1748; and he attracted attention by his essays on the *Sublime and Beautiful*, and devoted himself to literature. In 1765 entering parliament, his eloquence in American affairs created a great sensation in the house of commons. Returned for Malton, he became in 1780 his great opponent in the reform; and in 1782 he became paymaster under Lord Rockingham's government. He again took the side of the commons in 1783, when he made his famous speech on the India bill. In the impeachment of Warren Hastings, Burke was a leading part; his speech occupied six days over four days. In 1794 he retired from parliamentary life, though he continued to produce numerous pamphlets and treatises. His chief works are *A Vindication of Natural Society; Reflections on the Revolution in France*; and some others. Died at Beaconsfield, England, 1797.

**Burleigh (bur'li)**, William Cecil, Lord Cecil, English statesman.

**Burleigh, Albert Sidney**, lawyer, member of congress, was born 1863, at San Marcos, Texas; was educated at agricultural and mechanical College of Texas; admitted to the bar in 1884; appointed by the governor of Texas attorney of the twenty-sixth judicial district in 1891; elected to said office 1892-96; elected to the fifty-sixth, fifty-seventh, fifty-eighth, fifty-ninth, sixtieth, and sixty-first congresses.

**Burlingame, Anson**, American diplomatist; born in Chenango county, N. Y., 1826; member of the U. S. House of Representatives, 1861. He was sent as minister to China, and in 1868 he visited this country at the head of a Chinese mission, and concluded a treaty of friendship between the United States and China, which was promptly ratified by the Chinese government; died, 1870.

**Burnard, Edward**, English statesman; born in Woburn, England, 1823. He was educated at Exeter College, Oxford, where William Gladstone was his friend. About 1870 he began to be known as an oil-painter, and his works henceforth are inspired by the earlier art of J. M. W. Turner. He was shown more of grace and less of emphasis than his former paintings. Among his pictures are *The Artist's Creation; The Artist's Studio; The Mirror of Venus*. He furnished striking designs for stained glass at Christ Church, Oxford. He died, D. C., 1887. He was knighted (1883), and a baronet 1894. He died, 1898.

**Burnett (bur-net)**, Frances Hodgson, writer, playwright; born (Frances Follen) in Boston, 1819; died, 1896; began writing for magazines, 1867; married Dr. L. M. Burnett, 1873; resided in Washington, D. C., 1873-75; author: *That Lady's Lover; Dolly, a Love Story; Kathleen; Bury Tim and Other Stories; A Little Princess; Little Lord Fauntleroy; The Little Girl; The Man's Daughter; Emeralds; The First Gentleman of Europe; Nave; A Lady of Quality; The Shutter*.

**Burnham, Daniel Hudson**, architect; born Henderson, N. Y., 1840; removed to Brooklyn, 1860;

educated there and in Massachusetts; A. M., B. S., D. Architects Field's retail store, and many other buildings in Chicago and elsewhere, including the Mills building, San Francisco; Elliott Stock Exchange, New York; the Hotel Waldorf, Third, and Fourth National Banks, Cleveland; chief architect and director of works, World's Columbian Exposition, 1893. He has also been missions for beautifying Washington and Cleveland, Ohio.

**Burns, Robt. John**, labor leader, president of the British local government board since 1903; born London, 1858; since 1892 has represented Britain in the house of commons; member of the British cabinet, 1905. He has published many pamphlets, articles, and speeches.

**Burns, Robert**, Scottish poet, was born at Alloway, near Ayr, Scotland, 1759; died at Dumfries, 1796. He was the son of a small farmer, and was brought up amidst indigence and adversity. He revolted, however, the advantages of a common school education, though his chief advances in general knowledge he owed to the books he read, among which were *The Spectator*, the works of Pope, and the poems of Allan Ramsay. When sixteen years of age he fell in love, and his feelings, at that time, at once burst into song. His first volume of poetry was issued in 1786, from Kilmarnock, and at once became popular. The second volume, issued in 1787, was published in Edinburgh, induced him to take the farm of Millbank, near Dumfries, where he married his wife, Buffie, and he returned to Scotland in 1791, and, having been appointed to a position as excise-man, which had been obtained for him by a friend, he retired to his farm. He was entirely upon his income from that office, which yielded only about \$350 a year. In 1792 he wrote some of his best songs, as *My Bonnie*, and the melodies of Scotland; intemperance gradually gained upon him, while waste threatened him. He died, at the thirty-seventh year, he sank into an untimely grave.

**Burnside, Ambrose Everett**, American general, West Point in 1847. He left the army as lieutenant in 1852, but returned as colonel of volunteers in 1862, commanding a brigade at Bull Run, and in February, 1862, at Roanoke Island. In 1863 he successfully held the city of Suffolk, Va., and was killed through the battles of the Wilderness and Cold Harbor. Rejoining in April, 1865, he was elected governor of Maryland (1866), and United States senator in 1875 and 1881. He died at Bristol, R. I., 1881.

**Burr, Aaron**, American statesman, was born 1756, died 1823. He was a lieutenant-colonel in the revolutionary war; attorney-general of New York 1789; United States senator 1791-97; mortally wounded in 1804 by a duel with Aaron Hamilton, vice-president of the United States 1801-05; tried on a charge of treason, 1807, but acquitted.

**Burr, Abraham**, German-born American, born Graelen, N. Y., 1857; graduated from Cornell, 1881; student Leipzig, Paris and Zurich; LL. D.; Litt. D. Libraries the President's law library since 1878; member Cornell faculty since 1888. Writer on history of superstition and persecution.

**Burr, William Hubert**, engineer, professor civil engineering, Columbia University since 1893; born Watertown, Conn., 1851; graduated Kensington Polytechnic Institute, C. E., 1872; professor engineering, Harvard, 1892-93. Consulting engineer to department of public works, 1893-85, of parks, 1897-07, of docks, 1898-07, and now department of bridges, and aqueduct commission, New York. Appointed, 1900, by President Roosevelt, member United States commission, to consider British naval commission; consulting engineer to board of water works, New York. Awarded first place in national competition, 1900, for the memorial bridge across Fontaine de la Vierge.

**Burrill, Kilbu**, "the learned blacksmith," was born in Milford, Conn., 1810. He was sent to his father's place and at Worcester, Mass., but devoted all his leisure to mathematics and the study of the Greek, Latin, Arabic, and most of the modern European languages. He took a prominent part in advocating an ocean passage from New York to England, and in England, in 1865-70 as United States consul at Birmingham. He died at New Britain, Conn., 1880.

**Burrings (bur'z)**, John, essayist, naturalist, born Roxbury, N. Y., 1827; received an academic education at the University of the City of New York, 1847-53; national bank examiner, 1854-74; since 1874 has lived on a farm, devoting his leisure to the study of natural history. *Notes on Walt Whitman as Poet and Person; Locusts and Wild Honey; Fresh Fishes; Riveries; The Birds of the River; The River Port Bazaar; For and Near; Ways of Nature*.

**Burton, Ernest de Witt**, theologian, critic; professor of systematic theology, University of Chicago, since 1902; born Granville, Ohio, 1856; University of Leipzig, 1887; associate editor of *Practical Theology*, 1892-93; chief since 1900; editor (with others) of the *American Journal of Theology* since 1897. Author:

*Constructive Studies in the Life of Christ (with S. Matthews); A Short Introduction to the Gospels; etc.*

**Burton, Mr. Richard Francis**, English traveler, was born 1821, at Harham House, Herefordshire, and studied at Trinity College, Hartford, Conn. He followed Bonalland and service in the Crimea, he in 1855 set out with Speke on the journey which led to the discovery of Lake Tanganyika, 1858. He afterward traveled in America. He was subsequently consul at Santos in Brazil, at Damascus, and at Constantinople, and he was knighted in 1880. He died at Trieste, 1890.

**Burton, Thomas Erskine**, U. S. Senator, lawyer; born in Jefferson, Ohio, 1851; graduate of Oberlin College, 1872; admitted to bar, 1875; since then practicing law in Cleveland, Ohio. He was elected, 91, and 1895-1900; United States senator, 1900-14. Author: *Financial Crisis and Periods of Industrial and Commercial Depression, and Life of John Sherman*.

**Bury (bur')**, John E., British historian; regius professor of modern history, Cambridge University since 1902; was born 1861; graduate Trinity College, Dublin; M. A., Litt. D.; LL. D.; professor of modern history in Dublin University, 1885-1902; regius professor of Greek, 1896. Author: *History of the Later Roman Empire from Arcadius to Irene; Student's History of the Roman Empire from Augustus to Constantine*.

**Bushnell, Morace**, theologian, was born at Litchfield, Conn., 1802; graduated, Yale, 1827, and was for some time literary editor New York *Journal of Commerce*, 1831-32. He was a Congregationalist ministry 1833; preached at Hartford, 1833-58. He was a member of the American Board of Christian Theology, Vassar Seminary, died at Hartford, 1876.

**Butler, Benjamin Franklin**, American politician, and general, was born in New England. He studied law and settled in Massachusetts, where he became recognized as the leading democrat of New England. He was prominent in the service at the outbreak of the civil war, and had command of the departments of the gulf and of the south. After the acquisition of no military fame but great notoriety for his arbitrary civil regulations; governor of Massachusetts, 1882, Died, 1893.

**Butler, Joseph**, eminent English divine, was born 1602 at Wantage, in Berkshire; died 1752 in London. He was a graduate of Trinity College, Hartford, where he preached those remarkable sermons which he published in 1726. His great work, the *Analogy of Religion*, was published in 1726. In his three sermons, was published in 1736.

**Butler, Nicholas Murray**, educator; born Ellenville, N. Y., 1862; graduated at Princeton, 1884; Ph. D. 1884; admitted to Berlin and Paris, 1884-85; LL. D.; Litt. D.; dean faculty of philosophy, 1890-91; president of the University of Chicago, 1891-92; president since 1902. Editor of the *Educational Review*, the *Great Educators Series*; the *Teachers' Magazine*.

**Butler, Samuel**, English naturalist, was born at Breamham, England, 1612. The experience of his time furnished him with the material for his famous work, *Worms*, the first part of which appeared in 1680, and achieved the widest popularity. Died, 1680.

**Byron, Lord, George Gordon**, English poet, was born in London, 1788. In his eleventh year he succeeded his grandfather, William lord Byron, and took possession of Newton Abbey, the ancient seat of the family, situated a few miles distant from Nottingham. In 1800 he removed to Trinity College, Cambridge, and two years thereafter his first volume of verse, entitled *Hours of Solitude*, was published at New York. The *Idylls of Greece* were published in 1807. He was severely afflicted by Lord Brougham in the *Edinburgh Review*, and his sermons since Byron went to writing *Don Quixote* and *Walden*. In 1812 he published the first two cantos of *Childe Harold*, which, with his subsequent *Don Quixote* at Geneva, produced the first craze of *Childe Harold* and *The Prisoner of Chillon*. *Manfred* and *The Island* were written in 1817. The next year he was at Venice, and he died *Childe Harold* there. During the next three years he lived in the first five cantos of *Don Juan*, and a number of dramas of various merit. In 1822 he removed to Pisa, and worked there at his *Don Juan*. In 1823 he published *The Vision of Judgment*, occupied his pen almost up to the close of his life. In the summer of 1823 he was in Greece, and he died there, 1824.

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**Byström (boström)**, Johan Niklas, a Swedish architect, born at Filipstad, in the province of Westmanland, 1854. He was educated at the Sætergö of Stockholm, applying himself chiefly to the study of the antique, and gained the academy's prize in 1878. He was employed in the following year, whence he soon sent him *Drunkards and Repeating Buckshots*. He returned to Stock-

holm in 1815, and exhibited his colossal statue of the prince-royal. He died at Rome, 1848.

**Cabanis** (*ka-ba-nay*), **Pierre Jean Georges**, physician and philosophical writer, born at Conans, France, 1757; he furnished his countrymen with material for his speeches on public education; died at Mireusheim during his term. He died near Nieuw, 1808. His chief work is his once-famous *Rapports du Physique et du Moral de l'Homme*.

**Cabet** (*ka-bet*), **Etienne**, French communist, was born at Dijon, 1809; he furnished his countrymen with 1856, having gone out to Texas in 1848 to found an "Icarian commune," so named after his younger son, a "philosophical social reformer," describing a communist Utopia.

**Cable, George Washington**, author, was born in New Orleans, 1844; educated in public schools; M. A., Litt. D., Yale; Bowdoin; served fourth Mississippi cavalry, Confederate States army, 1862-63; since 1879 devoted to literature. Author: *Old Creole Days*; *The Grasses*; *Madame Delphine*; *The Creoles of Louisiana*; *Dr. Serris*; *The Silent South*; etc.

**Cabot** (*ka-bot*), **George**, American shipmaster, afterward merchant, was born 1751, died 1823. He was a member of the Massachusetts state constitutional convention, and of that which ratified the federal constitution; U. S. senator 1790-96.

**Cabot, John**, born 1450(?) **Cabot, Sebastian**, born 1744, two Venetians, father and son, were both celebrated navigators and explorers. John probably died 1498; Sebastian died 1557.

**Cædmon** (*ka-dm-on*), the father of English song, was the first Anglo-Saxon who composed in his own language of whom there is any record. The date of his birth is unknown, but his death occurred about 680 A. D. He was originally a cowherd, attached to the monastery of Whitby, and according to a legend was commanded in a dream to sing "the beginning of created things."

**Cæculpinus** (*ka-sul-pin-us*), Latin physician; born at Arezzo 1519; was professor of medicine and botany at Pisa, physician to Pope Clement VIII, and performed several medical works. He developed several new ideas on the circulation of the blood which are now well recognized. Died, 1608.

**Cæsar, Caius Julius**, a great Roman general, statesman, and historian, was born B. C. 100, died B. C. 44. He was the son of the praetor Caius Julius Cæsar, and of Aurelia, a daughter of Aurelius Cotta, the praetor of Asia. He lost his father, and shortly after he married Cornelia, the daughter of Lucius Cinna, the friend of Marius. This connection gave great offence to Sulla, the dictator, who prohibited him from returning to public life. His friends obtained his pardon with difficulty, and Cæsar withdrew from Rome, and went to Asia, serving his first campaign under M. Minucius Thermidius, the praetor of Asia.

On the death of Sulla, Cæsar returned to Rome, where he distinguished himself as an orator. He afterwards visited Rhodes, when he was taken by pirates, and compelled to pay fifty talents for his release. To revenge himself, he fitted out some vessels at Miletus, overtook the pirates, made the greater number of them prisoners, and had them crucified before Pergamus. He then returned to Rome, where his eloquence and liberality made him very popular. He was pontifex maximus in 63 B. C., praetor in 62 B. C., and governor of Spain in 61 B. C. On his return to Rome he allied himself with Pompey and Crassus in the memorable "first triumvirate," he became consul, and then obtained the government of Gaul with the command of four legions.

His military career was rapid and brilliant. He compelled the Helvetii, who had invaded Gaul, to retreat to their native country, subdued Ariovistus, who had driven a German tribe had attempted to settle in the country of the Aedui, and conquered the Belgæ. In nine years he reduced all Gaul, crossed the Rhine twice (B. C. 55 and 54), and twice passed over to Britain, defeated the gallant natives of this island in several battles, and compelled them to give him hostages. The senate had continued his rule in Gaul for another period of five years, while Pompey was in the command of Spain, and Crassus that of Syria, Egypt, and Macedonia for five years.

The death of Crassus in his campaign against the Parthians dissolved the triumvirate; and about the same time the friendship between Cæsar and Pompey cooled. The senate, influenced by Pompey, ordered that Cæsar should resign his office and command within a certain time, or be pro-

claimed an enemy to the state, and appointed Pompey general of the army of the Republic. Upon this Cæsar urged his soldiers to defend the honor of their leader, passed the Rubicon (49 B. C.), and made himself master of Italy without striking a blow. Pompey retiring into Greece, Cæsar then levied an army with the treasures of the state, and hastened into Spain, which he reduced to submission without coming to a pitched battle with Pompey's generals. He next conquered Mæstia (now Marcellæ), and returned to Rome, where he was appointed dictator. He followed Pompey into Greece, and defeated him at Pharsalia, from which Pompey escaped only to be assassinated in Egypt.

In Rome the senate and the people strove eagerly to gain the favor of the victor. They appointed him consul for five years, dictator for a year, and tribune of the people for life. When his dictatorship had expired he caused himself to be chosen consul again, and without changing the ancient form of government ruled with almost unlimited power. In 46 B. C. he crossed to Africa, defeated the Pompeians, Scipio and Cato, at Thapsus, and returning to Rome he was received with shouts of acclamation. In February, in the term of his dictatorship was prolonged to ten years, the office of censor conferred on him alone; his person was declared inviolable, and a sacred place beside that of Jupiter in the capital.

He soon after was honored with four several triumphs, made perpetual dictator, and received the title of *imperator* with full powers of sovereignty. In February, he declined the diadem which Antony publicly offered him, and next morning his statues were decked with diadems. His soldiers, however, were discontented, and a conspiracy was set on foot by his enemy, Cassius, and joined by many of his own friends, including M. Brutus; and, notwithstanding dark hints had been given to him of his danger, he attended a meeting of the senate on 15th (idea) March, 44 B. C., and fell beneath the daggers of the conspirators.

Cæsar was undoubtedly the foremost man of his age, being great as a statesman, a general, an orator, a historian, and an architect and engineer, and his assassination was brought about more by jealousy and envy than by real patriotism.

*Caesars*.—*Monna's History of Rome*; R. J. Delorme's *Caesar and his Contemporaries*; Napoleon III.'s *Froude's*, and *Fowler's Lives of Caesar*; *Barling-Gould's Property of the Caesars*; and *Holmes's Caesar's Conquest of Gaul*.

**Caiglieri** (*ka-i-gi-ri*), **Paolo Veronese**, an Italian painter of great eminence, was born at Verona in 1527. The church of San Sebastiano, in Venice, contains many of his productions, which are reckoned the most important of his earlier period, i. e., the period before he visited Rome, when he first became acquainted with the masterpieces of Raphael and Michelangelo. He died in 1588. The most celebrated of his productions are the *Marriage Feast at Cana of Galilee*, and the *Presentation of the Family of David to Alexander*.

**Calver, Henry Hall**, British novelist and dramatist; born in 1853, of Manx and Cumberland parentage; was educated at the University of Liverpool; became a journalist, and was for six years an editorial writer on Liverpool *Chronicle*. His first novel was *The Crime of Calver*, which came with *The Democrat*; *The Manxman*; *The Christian*; *The Eternal City*. Published in 1898. *My Story*, an autobiographical narrative of the earlier years of his literary life. He is justice of the peace in the Isle of Man, where, in 1897, he was elected to a large majority to the house of keys for Ramsey.

**Calder** (*ka-dar*), **Edward**, Scottish philosopher, was born at Glasgow, Scotland, 1806; he was educated at Glasgow University; Balliol College, Oxford; LL. D.; D. C. L.; fellow and tutor of Merton College, Oxford, 1831-32; he was professor of metaphysics, Glasgow University, 1846-83; master of Balliol College, Oxford, 1863-1867. Author: *Elements of Logic*; *History of the Inductive Method*; *Critical Philosophy of Emmanuel Kant*.

**Calder, John**, Scottish preacher, born at Greenock, Scotland, 1801; he was educated at Glasgow University (1818). He received the degree of D. D. in 1860, was appointed professor of divinity in 1862, and held the office of minister of Glasgow from 1862 to 1869. He published a volume of *Sermons*; *Spinoza*; etc. He died 1898.

**Calnes** (*ka-dar*), **John Elliot**, British economist, was born at Castle Bellingham, Ireland, 1823; studied at Trinity College, Dublin, where he graduated B. A. in 1848. An accident in his hunting-ground in 1862 led to a breakdown in health;

and, having resigned his chair in 1872, he died at Blackheath, 1875. Cairnes may be regarded as a disciple of Mill, though differing from him on many points.

**Calus Græchus** (*ka-lus-gra-echus*). See **Græchus**. **Calixtus** (*ka-lis-tus*), **Cardinal**, properly Jacopo Casanova, was born in 1605, and was elevated in 1608 became general of the Dominicans, in 1517 cardinal, in 1519 bishop of Gaeta, and in 1523 legate of the Holy See.

**Calderon** (*ka-dar-on*), **don de la Barra, Pedro**, Spanish dramatist, and one of the greatest of all time, was born at Madrid in 1600, and was educated at the University of Salamanca. He entered the army and served several campaigns in Italy and in Flanders, gaining a knowledge of men and things which he afterward made use of in his plays. He became a priest and royal chaplain, and died in 1681, still working at his literary labors. In his later life he wrote many religious plays.

**Calderon, Ignacio**, diplomat; was born at La Paz, Bolivia, 1848; graduate of University of La Paz; secretary of Bolivian legation at Rome, 1868-70. Traveled through United States, and for a time acted as consul-general of Bolivia at New York; returned to Bolivia, 1886, to manage affairs of foreign importing, and sporting companies; minister from Bolivia to United States since March, 1904.

**Calderwood** (*ka-dar-wood*), **Henry**, British philologist and scholar; born at Glasgow, 1800; died in Edinburgh, 1867.

**Calhoun** (*ka-houn*), **John Caldwell**, American statesman and diplomat; born in 1792, he was born in Abbeville county, South Carolina, 1782; graduated at Yale, 1804, and became a successful lawyer and a member of the bar at New York. In 1817 he entered Monroe's cabinet as secretary of war, and did good work in reorganizing the war department. In 1820 he was elected to the senate, and in 1824 he was elected to the senate, and in 1828 he was elected to the senate, and in 1832 he was elected to the senate, and in 1836 he was elected to the senate, and in 1840 he was elected to the senate, and in 1844 he was elected to the senate, and in 1848 he was elected to the senate, and in 1852 he was elected to the senate, and in 1856 he was elected to the senate, and in 1860 he was elected to the senate, and in 1864 he was elected to the senate, and in 1868 he was elected to the senate, and in 1872 he was elected to the senate, and in 1876 he was elected to the senate, and in 1880 he was elected to the senate, and in 1884 he was elected to the senate, and in 1888 he was elected to the senate, and in 1892 he was elected to the senate, and in 1896 he was elected to the senate, and in 1900 he was elected to the senate, and in 1904 he was elected to the senate, and in 1908 he was elected to the senate, and in 1912 he was elected to the 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in 1802, rose to be general in the war of 1812. In 1831-36 he was secretary of war, and in 1836-42 minister at Paris. Under Louis XVIII. he died in 47, and was secretary of state in 1857-60. He died at Detroit 1860.

**Casini** (*de-sa'-ni*), **Cicciavanti Domenico**, Italian astronomer and savant, born at Ferialino, near Nice, 1625, died 1712. In 1650 he was appointed to the astronomical chair at the observatory of Bologna. His first work related to the comet of 1652.

**Casini, Jacques**, son of the preceding, born at Paris 1677. In 1694 he was elected a member of the academy of sciences. On the death of his father he succeeded to the chair of the observatory at Paris, and died 1756. As an observer Casini was eminently successful.

**Cassius** (*de-ak'-s'us*), **Publius**, **Cassius Longinus**, Roman general and politician, was questor to Cæsar in the Parthian war, 54 B. C. After Pharsalia he was taken prisoner and pardoned by Cæsar. In 44 B. C. as praetor he attacked to himself the aristocrats who resented Cæsar's supremacy, and won over Brutus; and in the same year Cæsar was murdered. Cassius fled to the East, united his forces with those of Brutus, and at Philippi, being routed, compelled his freedman Pindarus to kill him, 42 B. C.

**Casson, Herbert Newton**, editor, socialist writer, born at Ontario, N. H., U. S., 1837, graduated at Victoria College; in 1863 went to Boston and with Morrison J. Swift organized the unemployed, and at head of 10,000 men marched on the city demanding relief. Founded first labor church in America, at Lynn, Mass., 1864; on staff of *Commons* 1865-66; editor of *Commons* 1866-67; of *Credulity*; many socialist tracts, etc.

**Castelar** (*de-ak'-lar*), **Emilio**, Spanish, writer, statesman, and military man, born at Seville 1832; was for some years professor of history and philosophy in the University at Madrid. A satirical humorous dictator, but, when the king, he fled across the frontier. He returned to Spain in 1876, and devoted himself more to literature than to political and social questions. He died in 1899.

**Castellargh** (*de-sel'-ar*), **de-sel'-ar, **Robert Stewart, Lord**, British statesman, eldest son of the marquis of Loosduney; was born in 1769; president of the board of control in 1802; and secretary of war in 1805. During Lord Castlereagh's absence, Lord Castlereagh again became a member of the government and foreign secretary, and concluded the treaty of Paris, 1814. He remained in office the remainder of his life, which was closed by illness in 1822.**

**Catharine I.**, empress of Russia; born about 1685; was the youngest infant of a Livonian peasant-queen, and became nurse in the family of the protestant minister of Maria Sophia, 1701 who married a Swedish general, who soon afterwards died with his regiment. She, and her returned husband, after the capture of Moscow by the Russians, Catharine became the mistress first to General Oster, with whom she met at St. Petersburg, Prince Menschikov, and finally, of Peter the Great, who married her privately near Warsaw in 1711, and publicly the next year at St. Petersburg. She then embraced the Greek religion, and took the name of Catharine. On the death of Peter in 1725, she was proclaimed empress. Her death was the result of intemperance. Died 1727.

**Catharine II.**, empress of Russia; born in 1729. As empress she seized the Crimea, and took part in the dismemberment of Poland. She promoted the welfare of Russia by encouraging literature and commerce, but her reign was sullied by dissolute amours. Died 1796.

**Catharine**, **Saint**, of Burma, is a saint belonging to the fourteenth century, born about 1347. She was said to have been favored with extraordinary revelations, and the people of Burma were said to have been impressed upon her body. Died, 1380.

**Catharine of Aragon**, queen of England; wife of Henry VIII.; born in 1485; daughter of Ferdinand of Aragon and Isabella of Castile. She was beautiful and virtuous, but married in 1501 to a divorcé on the ground that the marriage was unequalled. After much temporizing on the part of the pope, the marriage was pronounced invalid by Cranmer, archbishop of Canterbury, and his sentence was ratified by act of parliament. Died 1536.

**Catharine de Medici** (*de-ma'-di-chi*), born in 1519; great granddaughter of Lorenzo the Magnificent, daughter of Pope Clement VII. and Catherine II. of France, acted as regent during the minority of her second son, Charles IX. She instigated the massacre of St. Bartholomew in 1572.

**Catharine Parr**, born in 1512; daughter of Sir Thomas Parr; was the sixth and last wife of Henry VIII. She survived Henry, and was accused of poisoning his death by poisoning. Died 1548.

**Catharine** (*de-ak'-lar*), **Emilio**, Spanish, politician, born about the year 108 B. C., died 62 B. C. In the year 68 B. C. he was elected praetor, in 67 B. C. governor of Africa, and in 66 B. C. he was desired to stand for the consulship, but was disqualified on account of the accusations brought against him of maladministration in his province. His political conspiracies were frustrated by

Cicero, and he fled from Rome and took refuge with Manlius, who was in command of the army in Sicily. In 63 B. C. he fled to the island of Rhodes, encountered that of Catiline near Pistoia, and after a desperate battle he was defeated and slain. Catiline was executed. He was consul in 61 B. C., 1796; studied law, but soon turned to drawing and painting. During 1832-40 he was in the United States, and in 1840-41 he was in 1832-57, in South and Central America; and again lived in Europe until 1871. He died at Jersey City, N. J., U. S., 1876. He was the author of *North American Indians*, *The North American Indians*, and *Last Rambles in the Rocky Mountains*.

**Cato** (*de-ak'-lar*), **Publius**, **Cato**, Roman statesman, afterward known as Cato Praetor, or Cato Major—to distinguish him from Cato of Utica, the younger, who lived in 184 B. C. Cato was elected censor, and discharged so rigorously the duties of his office that the epithet *Censorius*, formerly applied to all persons in the same station, was made his permanent surname. He repaired the water courses, paved the reservoirs, cleaned the drains, raised the rents paid by the publicans for the farming of the taxes. In the year 178 B. C. he was sent to Carthage to negotiate with the Carthaginians, and the Carthaginians and the Numidian king, Masinissa; but having been offended by the Carthaginians he returned to Rome, where he was again described Carthage as the most formidable rival of the empire, and concluded all his addresses in connection with the military trials to begin with the words, "Ceterum censeo, Carthaginiæ esse delendam." (For the rest, I vote that Carthage must be destroyed.) Died 149 B. C.

**Cato, Marcus Porcius**, named Cato the "younger," or Cato Uticensis, born 95 B. C. From Macedonia, he returned to Rome, and in 68 B. C. he was elected praetor, and in 67 B. C. he was elected consul, and in 66 B. C. he was elected censor, and in 65 B. C. he was elected consul, and in 64 B. C. he was elected consul, and in 63 B. C. he was elected consul, and in 62 B. C. he was elected consul, and in 61 B. C. he was elected consul, and in 60 B. C. he was elected consul, and in 59 B. C. he was elected consul, and in 58 B. C. he was elected consul, and in 57 B. C. he was elected consul, and in 56 B. C. he was elected consul, and in 55 B. C. he was elected consul, and in 54 B. C. he was elected consul, and in 53 B. C. he was elected consul, and in 52 B. C. he was elected consul, and in 51 B. C. he was elected consul, and in 50 B. C. he was elected consul, and in 49 B. C. he was elected consul, and in 48 B. C. he was elected consul, and in 47 B. C. he was elected consul, and in 46 B. 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talas, and his most popular romance, *De Loeus* or *de Vloerden*, and his most famous, *De Loeus* or *de Vloerden*, and his most famous, *De Loeus* or *de Vloerden*.

**Considérant** (*kôn-si-d'ran'*), **Victor-Froper**, French socialist, was born at Salins, France, 1808; he entered the army, and was wounded at Waterloo; he left to promulgate Fourier's doctrine. On the death of his master, Considérant became head of the school, and, as such, he was accused of high treason, and fled from France. In Texas he founded a community, *Le Rénouveau*, which flourished for a few years. He returned to France in 1850, and died 1863.

**Constable** (*kon-sta-b'l*), **John**, landscape painter, born in East Berkhampstead, Essex, England, 1724 (died suddenly 1781). The national gallery has his best pictures, *The Cornfield*, *The Valley Farm*, and *The Haystack*.

**Constant** (*kôn-stan*), **Flavius Julius**, emperor of Rome, was born about A. D. 330. He was the youngest son of Constantine the Great, and on his death, 337, he received as his share of the empire, Western Illyricum, Italy, and Africa. He was a weak and cruel ruler, and at last Magnentius, his general in Gaul, sent some conspirators to kill him A. D. 350.

**Constant de Beheque** (*kôn-dé' ds vè-èk*), **Henry Benjamin**, author and politician, was born at Lausanne, Switzerland, 1767. Educated at Oxford, Erlangen, and Edinburgh, he in 1793 settled in Paris as a publicist and after the second restoration of the Bourbons wrote and spoke in favor of constitutional reform.

**Constantine I.** (*kôn-stan-fîn*), called the Great; born in 312, at Nisaea. On the death of his father he was crowned emperor of the East, and in 313 he was proclaimed emperor by the troops; he was acknowledged emperor by the senate in 312, and thereafter an edict was issued, on which he granting toleration to the Christians. He had still to extend his empire over the East, and having done so by the death of Licinius, he transferred the seat of his empire to Byzantium, which was thereafter called Constantinople, i. e., Constantine's city. The constantine was adopted by 327 as a Christian, after having three years before proclaimed Christianity the state religion. Died 337.

**Constantine X. Palaeologus**, last emperor of the East, born in 1394. The Turkish sultan, Mohammed II., determined to take Constantinople and laid siege to it with a great army, 1453. Constantine, who had only about 9,000 soldiers, resisted bravely for nearly two months, but at last the Turks battered down the walls, and the emperor and his little band of nobles were all slain.

**Constantinus L.**, called Chlorus, a Roman emperor, father of Constantine the Great, born about A. D. 250. He died at York, England, 306.

**Constantine II.**, a Roman emperor, the second son of Constantine the Great, born 317. His cousin Julian won so many victories that the army proposed him emperor, but he was slain by the army against him, but died on the way, 361. He was succeeded by Julian.

**Cooley, Sir William Martin**, English traveler, artist, and geographer, born at Rochester, England, 1856; was educated at Trinity College, Cambridge. University extension lecturer, 1882-85; professor of art, University College, Liverpool, 1888-89; president of the Alpine club, 1902-04. Author: *Woodcuts of the Netherlands in the fifteenth century*; *Early Flemish Artists*; *Literary Remains of Albrecht Dürer*; *No Man's Land* (history of Netherland); etc.

**Conwell, Russell Herman**, lecturer, educator, Baptist clergyman; born at Worthington, Mass., 1842; captain of infantry 1862-65, in U. S. army; promoted to lieutenant-colonel, 1865; foreign correspondent *New York Tribune* and *Boston Traveler*, 1866-70, now president of the Worcester Association.

**Cook, Albert Stanborough**, educator; born at Newbury, N. H., 1833; graduated at Rutgers college, 1857; N. H. A. S. 1857; associated in English, Johns Hopkins, 1879-81; professor of English, University of California, 1880; professor of English language and literature, Yale, since 1889. Co-editor of *Journal of English and German Philology*, 1897-1905.

**Cook, Captain James**, celebrated English navigator, best known through his *Voyage Round the World*; born in Marton, in North Riding, Yorkshire, 1728. After his death at Hawaii, on the Sandwich Islands, 1779, many honors were paid to his memory, both in his own and in foreign countries.

**Cooke, Josiah Parsons**, American chemist, was born at Boston, Mass., 1827, and was professor of chemistry at Harvard, 1850-51. His scientific works are *Elements of Chemical Physics*, *Principles of Chemical Philosophy*, *The New Chemistry*, etc. Died at Newbury, Mass., 1890.

**Cooke, Sir William Fothergill**, British electrician, born at Ealing, England, 1806; was educated at Durham and Edinburgh universities. He was the first to use the Albert gold medal; Cooke was knighted in 1869. He died 1879.

**Coley, Thomas Melville**, American jurist, was born at Attica, N. Y., 1816; was admitted to the bar 1840, and became professor of law at the university of Michigan, 1859; was associate justice Michigan supreme court, 1864-68, and chief-justice 1868-83. He died 1898.

**Coolidge, Archibald Cary**, historian in history,

Harvard, 1868-99, professor since 1904, born at Boston, Mass., graduated from Harvard university, 1837. With Taft party to Philippine islands, 1905-06; Harvard lecturer at the Sorbonne and University of Berlin, 1906-07; was editor of the *Review* devoted to American historical review, the *New York Nation*, etc.

**Cooper, John Jefferson**, manufacturer, diplomat; born at Boston, 1831; educated at Harvard; LL. D., Harvard, 1902. Embarked in business in New York, and was successful in commerce; largely interested in cotton mills; formerly president of Aetna, Topeka and Santa Fe railroads; United States minister to France, 1892-93.

**Cooper, Anthony Ashley, See Shaftesbury.**

**Cooper, John Montgomery**, novelist, journalist, was born in Burlington, N. Y., 1790. After six years' experience of naval life, he retired from the sea in 1810, and took up his residence at Cooperstown, Otsego county, N. Y. In 1821 appeared his first work, *Pioneers*. In quick succession followed *The Two Admirals*, and once more secured for him a place in the first rank of novelists; his sea stories, his famous "Leather Stocking series," and his tales of the frontier, and his passing some years in Europe, died at Cooperstown, in 1851.

**Cooper, John Montgomery**, priest, educator, was born in Rockville, Md., 1881. He studied at the American College, Rome, Italy, 1899-1905; Ph. D., Rome, 1906. He was ordained Roman Catholic priest, and has been instructor in Christian religion, University of America, Washington, D. C., since 1909.

**Cooper, Peter**, American inventor, manufacturer, was born in New York, 1810. His first invention was an improvement in a machine for shearing cloth. In 1830 he erected iron works at Paterson, N. J., and in 1832 constructed after his own designs the first locomotive engine ever made in this country. But the work of his life was the founding of an institution for instruction of the industrial classes—the Cooper Union, New York, whose corner stone he laid in 1854. In 1872 the independent party nominated him for president of the United States, and he received nearly 100,000 votes. Died, 1883.

**Cooper, Sir Henry Fasten**, a celebrated English surgeon, was born in Brooke, Norfolk, 1768; studied under Henry Cline, surgeon to St. Thomas' hospital, London, and was made a member of the society of anatomy there, 1799. In 1822 he was elected one of the court of examiners of the college of surgeons, and died in 1827, probably of cholera. He was of Oxford, and an LL. D. of Edinburgh. He died 1841.

**Cope, Abby**, **Edward Drinker**, American naturalist, born in Philadelphia, 1840. He early achieved success as an investigator in herpetology, and in 1861 he published his first book, *The Reptiles of the United States*. He resigned because of poor health, 1867. He died at Philadelphia, 1887.

**Cope, Sir Richard D. Alexander**, English naturalist, born at Thorn, then in Poland, 1473, his family being supposed to have come originally from Westphalia. Having studied medicine and theology at Caen, and law at Bologna, he was made a canon of Frauenburg in 1497. In 1500 he went to Rome, where he taught mathematics and astronomy. He studied medicine at Padua, and in 1505 finally left Italy for Prussia to carry out the work of his life.

Doubting that the motions of the heavenly bodies could be so confused and so complicated as to require the aid of a hypothesis, he was induced to consider the simpler hypothesis that the sun was the centre round which earth and the other planets revolve. Besides the experimental truth Copernicus anticipated many other of the principal features of astronomical science, such as the motion of the earth round its axis, the immense distance of the stars which made their apparent position the same from any part in the earth's orbit, etc. His general theory also enabled him to explain for the first time many of the important phenomena of nature, such as the variation of the seasons and the precession of the equinoxes.

The great work in which Copernicus explained his theory, *De Orbium coelestium Revolutionibus* (On the Revolutions of the Heavenly Spheres), was completed at Frauenburg and published at Nuremberg in 1543. He died at Frauenburg, 1543.

**References.**—*Life and Works of Copernicus*, by George F. Swarth, *Prussian House of Representatives*, by A. M. Clerke; and *Lives of the astronomer* by Gascoigne, Von Hipler, and Polkowski.

**Copsey, John**, English landscape painter, was born at Bolton, Mass., 1737. Washington sat to him in 1765, and later, in London, he painted George III. and his children. He became the friend of such men as West and Reynolds. He died at London, 1815.

**Coppeé** (*kô-pé'*), **François**, French poet, was born at Valenciennes, 1804. He was a literary clerk, he early gave himself to poetry, and with *Le Reliquaire* and *Les Jambes*, gained the front rank of the poets of the day. He died in 1860. Some years to *La France*, Coppeé entered the academy in 1864.

**Coppeé** (*kô-pé'*), **Benoit Constant**, French actor, born at Boulogne, 1841, was admitted to the conservatory in 1850, and having gained the prizes for tragedy and comedy, he joined the Théâtre Français, 1860. For a quarter of a century he played here with unbroken success, both in tragedy and comedy, and was especially noted in the broader aspects of comedy standing without a rival. Died 1900.

**Coppeé**, **Paul-Marie**, dramatic critic, born at Chicago, 1870, graduated at Harvard, 1892. A. M., 1893; Balliol college, Oxford, 1894-95. Dramatic critic, *New York Tribune*, 1896. Permeant critic, *New York Sun*, 1905-07; literary manager, *New Theater*, New York, 1908. Author: *An American of Oxford*; *A New Portrait of Shakespeare*.

**Corday d'Armann** (*kô-d'ar-man'*, or *môn'*), **Marie Charlotte**, French heroine, was born in 1768, at St. Saturen, Normandy, of a noble Norman family; sympathized with the ideas of the French revolution; visited Paris in July, 1793, with the purpose of assassinating Robespierre; obtaining an interview with the former while in his bath, she stabbed him with a knife; was immediately apprehended and executed four days after ward.

**Correll** (*kô-rel'*), **Marie**, English novelist; of mingled Italian and Scotch parentage and connections, she came to France in 1810. Her first book, *A Romance of Two Worlds*, was an instant success, and from that time she has devoted her life to writing. She died in 1890. Her husband, Edward Morris, of Chicago, to purchase Harvard University, which she had bought from Harvard University, to which it now belongs.

**Corey, William Ellis**, capitalist, steel manufacturer, was born at Philadelphia, 1804. At sixteen entered the service of the Pennsylvania Railroad, and was chemical laboratory of John Thompson steel works; invented Carnegie reformed armor. Succeeded by Carnegie, M. P. Steel, and has been president of Carnegie steel company, National steel company, and American steel hoop company; president of the United States Steel Corporation, 1911.

**Cornell** (*kô-rnell*), **Pierre**, a French actor, was born in 1806, at Rouen. He studied for the priesthood, but was dissuaded from it, and became the rival of a friend, first prompted him to write verse. In 1855 appeared his *Médée*, a drama, dedicated to Victor Hugo, and which was a success. Cardinal Richelieu, who aspired to be patron of the stage, wished to number Cornell among his favorites, but he was too proud to allow as to alter the plan of a comedy, and thus lost the cardinal's favor. He now returned to his private life, and in 1860 he was elected to the Académie française. He died in 1860, and was buried in the cemetery of St. Saturen. He was a member of the Académie française.

**Cornelia** (*kô-rnell'*), the daughter of Scipio Africanus, was the wife of Tiberius Sempronius Gracchus, who was consul, 97 B. C.

**Cornelius**, **von** (*fon kô-rnell'*), **Peter**, German painter, was born at Düsseldorf 1787, and studied under Lange in the academy of his native town. His chief works are frescoes in the Glyptothek and Ludwigskirche, in Munich. Died, 1867.

**Cornell, Ezra**, American philologist, was born 1807, at Westchester Landing, N. Y.; died 1874, at Ithaca, N. Y. He began life as a mechanic and miller at Ithaca, N. Y. In 1868 he founded Cornell University at Ithaca, with an endowment of \$500,000 to which he subsequently added nearly \$1,000,000. He was elected president of the library at Ithaca, at a cost of \$100,000.

**Corning, James Leonard**, physician; born at Stockbridge, N. Y., 1795. He studied at Andover and Würzburg, M. D., LL. D. Specially distinguished as neurologist; discoverer of spinal anesthesia; member of many medical and scientific societies. Author: *Cerebral Compression*; *Brain Rupture*; *Brain Excitation*; *Local Anesthesia*, etc.

**Cornwall, Barry**, English actor, English statesman and general, was born 1728. He entered the British army in 1745, entered the house of commons 1760, and the house of lords 1763. In 1780 he defeated General Gates at Camden, won the battle of Guilford court house, 1781, and surrendered to Washington at Yorktown, October 19, 1781. Appointed, in 1805, governor-general of India at Calcutta, and in 1806, governor of the province of Benares, while on his way to assume the command of the troops.

**Corot** (*kô-rô'*), **Jean Baptiste Camille**, French painter, pupil of Michelangelo and Bertin, and founder of the impressionist school; was born in Paris, 1796. He was a member of the Académie des beaux-arts, and was the first in the world. He died at Paris, 1875.

**Correggio** (*kô-ré-gio'*), **Antonio Allegri**, celebrated Italian painter, called the "Master of the birth," a small town near Modena, now called Reggion; was born 1493. He was the founder, or rather the initiator, of the school of painters of some Lombard, by whom the Parma school of painting, died, 1534.



**Corsen, Hiram**, professor of English literature, Cornell, 1870-1903; professor emeritus since 1903; born at Philadelphia, 1828; L.L.D., Litt. D., A.M., and editor of *the New York Times* in language, literature, and criticism, including: *Hand-book of Anglo Saxon and Early English*; *The Poems of Geoffrey Chaucer*; *Introduction to the Prose and Poetical Works of John Milton*; etc.

**Cortelyou, George Bruce**, public official, financier, born in New York City, 1846; graduated at the schools of the Georgetown and Columbian (George Washington) Universities, L.L.D. in 1866; was assistant treasurer of the President Cleveland, 1886; executive chief; 1898, assistant secretary to President McKinley; 1900, secretary to the president, and 1901, representative by President Roosevelt; was appointed secretary of the newly established department of commerce and labor, 1903. He entered the new cabinet, as postmaster-general, and 1907 was appointed secretary of the treasury. In 1909 he became president of the New York gas company.

**Cortes, or Cortes (kôr'tez), Fernando**, a Spanish adventurer; born in Medellin in Estremadura in 1485; he went early in the sixteenth century with Vlasquez, to Cuba, and subsequently obtained the command of the expedition sent against Mexico. He advanced to Mexico, where he was at first received with friendly demonstrations; but on the seizing Montezuma, the Mexican king, whom he subsequently put to death by fire, a struggle ensued, in which many thousands of his men were lost. He eventually succeeded in putting down all opposition, and in the conquering of Mexico. He was rewarded with the title of prince, and a grant of land in the new country. On his return to Spain, he found himself very much neglected. He died near Seville, in 1547.

**Corwin, Matthias**, see **Matthew Corwin**.

**Corwin, Thomas**, lawyer and orator, was born in Bourbon county, Kentucky, 1741; removed to Appleton early enough to be president of the county, 1818; was elected a member of congress in 1820, in 1840 governor of Ohio; elected to the senate of the United States in 1848; re-elected secretary of the treasury by President Fillmore in 1850. Died in Washington, D. C., 1866.

**Cosens (kôr'sen), Ellis**, an ornithologist, was born at Portsmouth, N. H., 1842, and graduated at Columbian University, 1861; M. D., Columbian, 1864; his works are: *Field Ornithology*, 1879; *Field Ornithology*, *Dictionary of North American Birds*, etc. Died 1899.

**Coulans (kûl'ân's), Fustel de**. See **Fustel de Coulanges**.

**Coulter (kûl'ter), John Merle**, botanist, head professor of botany at Cornell University, 1868-1896; born at Ningpo, China, 1851; graduated at Hanover College, Indiana, 1870; Ph. D., University of Indiana, 1873; professor of botany, 1893-96. Author: *Manual of Rocky Mountain Botany*; *Manual of Texas Botany*.

**Courbet (kôr'bê), Gustave**, French painter, was born at Ornans, Franche-Comte, 1819. In 1840 he was sent by the government to Rome, in Paris, but the bent of his nature was toward art. In 1841 he took to landscape painting, in the forest of Fontainebleau. In 1844 he began to exhibit at the salon; and his work created a great sensation in 1850; he retired to Tourd-Polite, near Vevay, in Switzerland, where he died in 1877.

**Cousin (kû'sin'), Victor**, French philosopher, was born in Paris, 1792; died at Cannes, 1867. After a literary career extending over many years, he was made, in 1830, under the ministry of M. Guizot, a member of the council of public instruction in France. He published a translation of the *History of Philosophy*, in five volumes, which was his largest original work. His last years were spent in retirement at his chateau, Soreboise.

**Couture (kû'tûr), Thomas**, French painter, pupil of Delacroix, was born in 1815. His chief work is *Remains de la Descente*. Died near Paris, 1879.

**Coverdale, (kûv'rad), Miles**, translator of the Bible, was born in York, England, and died in London, 1569. He was a monk of Norwich, but early devoted himself to the work of the translation. His translation, with Thomas Tymond's translation are still used in the services of the church of England.

**Cowley, Abraham**, with his own day considered the greatest of English poets, was born in London, 1618. From Westminster school he proceeded to Trinity College, Hartford, and afterwards here wrote, among many other papers, a large portion of his epic, the *Dorinda*, his hero King Charles. On Cromwell's return to England he was banished and returned to England at the restoration. He died at Chertsey, 1667, and was buried in Westminster Abbey.

**Cowper, William**, English poet, was born, 1731, died 1800. He was admitted to the bar in 1754, but did not practice. He passed many years at his home, in Buckinghamshire, in the society of Mrs. Unwin, Lady Austen, and the Rev. John Newton, engaged in religious exercises and charities. Lady Austen turned his attention to poetry, and after contributing sixty-eight poems to the *Dorinda* series, he published in 1783 his first volume.

The ballad of *John Gipsy* gave him a wide renown. In 1799 he revised his *Home*, and wrote his last poem, *The Cowway*.

**Cox, Samuel**, English landscape painter, was born at Deritend, a suburb of Birmingham, England, 1783. He studied in London with John Varley. From 1811 to 1814 he lived in London, where he was in 1814 settled at Harborne, near Birmingham, where he died, 1859.

**Cox, Sir George William**, English writer, mythologist, was born 1827, educated at Rugby school and Trinity College, Oxford. In 1877 he succeeded to the post of lecturer. Among his works are: *Tales of Ancient Greece*; *Argan Mythology*; *History of Greece*, etc. Died 1902.

**Coxsanders, Charles**, born in Warren, Ohio, 1850; studied in Cincinnati and Philadelphia; in Paris under Carpeus Duran and Gerome, 1872-82. He settled in New York, he contributed to leading magazines on art subjects. Author: *Myself*; *Myself*; *Old Masters* on New York.

**Cox, Palmer**, artist, born in Cranby, Quebec, Canada, 1840; graduate of Gresham Academy; lived in San Francisco, 1863-76. His specialty is original humorous pictures illustrating his own books. Author: *The Broome at Home*; *The Broome Around the World*.

**Cox, Samuel Sullivan**, American politician and diplomat, was born in Ohio in 1824, and died in 1904. He was elected governor of Ohio, 1859-62; represented an Ohio district in congress; in 1865 he moved to New York, and was returned to congress in 1866. He was minister to Turkey, 1885-88. The present arrangements for taking the national census, the largely of his energy in the treasury saving service, which is one of the most efficient branches of the government service, is almost entirely his work.

**Coxe (kôk), Arthur Cleveland**, American Episcopal bishop, was born at Mendham, N. J., 1818; and was elected bishop of New York, 1868. He was born in 1838, and became well known as a churchman and a writer. He became the rector of St. Paul's church in New York in 1899, and bishop of western New York in 1905.

**Crabbe (krâb), George**, English poet, born 1754, died 1832. He was a surgeon, but abandoned his profession for literary adventure, and went to London in 1780. He was ordained a priest in 1782, and became chaplain to the Duke of Rutland at Belvoir castle. In 1783 he published *The Village*, and in 1807 *The Parish Register*, his best work.

**Cradock, Charles Robert**. See **Murree, Mary Neill**.

**Crambo, Charles**, Mrs. Pearl Mary Theresa. See **Hobbes, John Oliver**.

**Crane (krâd), Mary, Dinah Mary**. See **Mulock**.

**Crane, William**, English Scottish writer and educator, was born at Kenworthy, Wilt, 1798; studied for the church at St. Andrews, but settled in London in 1820, where he became professor of English literature in Queen's College, Belfast. Died at Belfast, 1868.

**Crane, William H.**, German painter, was born near Bumberg, Germany, 1472. In 1520 he bought an apothecary's business at Wittenberg, where he was also a book-seller and paper-maker, became counsellor and chamberlain, and was twice chosen burgo-master of the town. He was an intimate friend of Luther, whose picture he several times painted. Cranch died at Weimar, 1553.

**Cranch (krânch), Christopher Pearce**, American painter, was born at Alexandria, Va., 1813; studied in France and Italy in 1846-63; returned to New York and became a member of the national Academy in 1864. Died 1892.

**Crane, Walter**, English painter, decorator, designer, was born at Bury, Lancashire, 1845; worked in Liverpool, 1845. Apprenticed to W. J. Linton; first illustrated book, *The New Forest*, 1863; *Illustrations of the Works of Shakespeare*, 1864; *Illustrations to Shakespeare's Tempus*, *Two Gentlemen of Verona*, *Merry Wives of Windsor*; *Decorative Art*, *Book of Hours*, etc. Died at London, 1902.

**Crane, William H.**, actor born at Leicester, Mass., 1845; debut Ultra, N. Y., 1863; appeared with the *Harvard House*, 1877, followed by numerous successes, including the two *Dromios* in Shakespeare's *Comedy of Errors*, ending with *The Heretics*.

**Crane, Winthrop Murray**, manufacturer, United States senator, was born at Dalton, Mass., 1858; A. B., Williams, 1877. Lieutenant-governor of Massachusetts, 1897-99; governor of Massachusetts 1902-03; United States senator from Massachusetts appointed in 1904; died in 1905, still term expiring 1907, and re-elected that year for another year.

**Cranmer, Thomas**, archbishop of Canterbury, was born 1489, and educated at Cambridge University. He obtained the favor of Henry VIII, by having studied the divorce from the pope, and was appointed primate in 1533. He favored the reformed doctrines during the reign of Henry VIII, and was the chief of Edward VI. Cranmer was thoroughly established, and the *Book of Common Prayer* compiled, 1549, under his guidance.

He was committed to the Tower on the accession of Mary, condemned at Oxford for heresy in 1554, and, after two years' imprisonment, burned there, openly rejecting the reprieve granted by the queen, which he had been induced to sign. Died, 1556.

**Cranus (krâ'us), Lucius Licinius**, Roman orator and statesman, first consul, 140 B. C. He was consul in 98, and censor in 92 B. C. Died 91 B. C.

**Crausac, Marcus Licinius**, Roman general and statesman, was born about 105 B. C. Pintarch estimates the wealth of Crausac at more than 7,000 talents, and the revenues of the province of Crausac were worth 8,000 talents. About 60 B. C. Caesar, Pompey, and Crausac became members of the first triumvirate. Crausac was killed at the battle of Pharsalus, 48 B. C.

**Crawford, Francis Marion**, American novelist, was born at Bagli di Lucca, Italy, 1854. From 1881 to 1883 he was in America, and subsequently resided at Sorrento, Italy. He published over forty novels, including *Mr. Isaacs*; *An American Politician*; *Brotherhood*; *Survivors*; *With the Immortals*; *The Rulers of the South* (Italy); *Murieta*; *A Maid of Venice*; *Cecilia*; *The Story of Modern Rome*; *The Heart of Rome*; *A Lady of Rome*; and the play *Francesca da Rimini*, produced by Sarah Bernhardt in Paris, 1902. Died 1909.

**Crawford, Thomas**, American sculptor, was born in New York in 1814. His principal works are the bronze statue of Christopher Columbus, in the Boston museum hall, the colossal equestrian statue of Washington at the capitol, Richmond, and the statue of George Washington in the city capitol, Washington. Died in London in 1857.

**Crawford, William Harris**, American statesman, born in York, England, 1792; graduated at the Columbian college, Georgia, was admitted to the bar 1796, and began his practice in Lexington, Georgia, 1800. He was elected to congress, and to the United States senate to fill a vacancy in 1807, re-elected for a full term 1811, and was elected president of the senate, 1812. He received the nomination for president, 1824, and in the election had forty-one electoral votes.

**Creasy (krî's), Sir Edward Shepherd**, English historian, born at Bexley, Kent, in 1812; from 1836 to 1840 he was a lecturer at King's College, London, and in 1840 was elected a fellow; in 1840 was appointed professor of history at London University, in 1860 he was elected to the office of professor of history at Hampton Hill, 1878. He was author of *The Fifteen Decisive Battles of the World*, *Invasions of England*, *History of the Crusades*, etc.

**Creel, Enrique C.**, Mexican diplomatist and statesman, was born at Chihuahua, Mexico, 1854; he was minister to the United States, 1898-1900; speaker of house, 1892; governor of state of Chihuahua, 1903-06; ambassador extraordinary and minister plenipotentiary of Mexico to the United States, 1906-09.

**Creelman, James**, author, journalist, and associate editor of *the New York Times*, 1868-1890. He was born, 1859. Editorial writer and correspondent, New York Herald, 1877-90, was aide on General Sherman's staff, 1862-63, and was shot after he received surrender of Spanish commandant at El Casey, 1898. Author: *On the Great Highway*, *English History*, etc.

**Creighton (krî'gan), James Edwin**, editor, professor of logic and metaphysics, Cornell, since 1896, was born in Paris, Nova Scotia, 1861; Ph. D., Cornell, 1892; L.L.D., Queen's University, 1893. Editor of *Philosophical Review*; American *Factor of Kant Studies*. Author: *Introduction to Logic*.

**Creighton, Mandell**, English historian, born at Carlisle, 1843; graduated at Merton College, Oxford, and was elected a fellow in 1866. He became vicar of the church of Northampton, in 1875, first professor of ecclesiastical history, at Cambridge in 1884, bishop of Peterborough in 1891, and of Exeter, 1896. He was elected in 1871, he was yet sent to carry the news of the victory to the pope and the French king. He abhorred the pope, and the French king, and took part in the siege of La Rochelle in 1573. When the peace with Savoy was concluded, Crillon retired to his native land, and lived the rest of his life in the exercise of piety and penance. Died 1615.

**Crépié (krî'pî), Francesco**, Italian statesman, was born near Rimini, Italy, 1800; he was elected to the bar at Palermo, but, joining the revolutionary movement of 1848, had to flee to France; in 1854 he was elected to the Italian parliament, and his efforts were made to discredit him by connecting him with a series of bank scandals; in 1896 the Abyssinian disaster of Adwa compelled his resignation. Died 1901.

**Critias (krî'â's), a**, pupil of Socrates, but a hearty rather than a doer of his word. He had a high reputation as an orator, also as a writer, poetry.

**Crittenden (krî't'ên), John Jordan**, American statesman, born in Kentucky in 1796. After having studied law at the University of Virginia, he was, in 1816, became a member of the Kentucky house of representatives, and was elected United States senator in 1827. He was elected in 1855. In 1841 he became attorney-general in President Harrison's administration; and in

1848 was elected governor of Kentucky. He opposed the secession movement in 1860-61. Died, 1863.

**Crocker, Francis Bacon**, electrician, physicist, professor of electricity, engineering, Columbia, since 1889; born at New York, 1815; graduated at Columbia, M. E., 1832; Ph. D., 1835. President American Institute of Electrical Engineers, 1897-98.

**Crockett, David**, American pioneer and politician, was born in Tennessee, and was noted for his adventures and eccentric habits, and was a member of congress from 1827 to 1831, and from 1835 to 1836. He was killed in Texas in their revolt against Mexico, was taken prisoner at Ft. Alamo in 1836, and was killed in that celebrated battle.

**Crockett, Samuel Rutherford**, British novelist; born in Dunchrae, Galloway, 1860. Educated at Edinburgh, Heidelberg, and Berlin. Gained the Estera Free church of Scotland, 1886; minister of Penicuik for some years, then became a writer and journalist.

**Croesus** (*kr'ezus*), last of the kings of Lydia, in the sixth century B. C.; celebrated for his wealth, so that his name became a synonym for a man overwhelmed by the favors of fortune.

**Crofts, Ernest**, British painter, keeper of the Royal Academy; born in Yorkshire, 1847; educated at Rugby and Berlin. Studied art at London and Dusseldorf. Pupil of A. B. Clay and Professor Hunter.

**Cromer (kr'mr)**, Evelyn Baring, first Earl, British statesman and diplomat, was born at Cromerhall, Norfolk, 1829; educated at Eton, Harrow, and Rugby; Royal Military Academy, Woolwich. Hon. D. C. L., Oxford; LL. D., Cambridge; financial adviser to the Egyptian government, 1883; financial minister at conference in London on Egyptian finance, 1884; agent and consul-general, Egypt, 1883-1907. Author: *The War Game*, and other military works; *Modern Egypt* (2 volumes); etc.

**Cromwell, Thomas**, revival of the spinning-mule; born near Bolton, England, 1753; for five years he worked at his project, and at last sold it for 50 pounds. It revolutionized the manufacture of British muslin, and brought wealth to all save the inventor, who died in comparative poverty, 1827.

**Cromwell, Oliver**, the great Protector, born at Huntingdon, in 1599, of Welsh descent—one of his ancestors, called Williams, having adopted the surname of his patron, Thomas Cromwell, whose agent he was in the suppression of the monasteries. Early experiencing a 'saving change,' he emerged from his period of gloom and anxiety a stern and convinced Puritan and Calvinist, and determined to determine the religious pretensions in church and state. He sat as a member for Huntingdon in the Parliament of 1628. When the Scottish revolt compelled Charles to summon a new Parliament (1640), Cromwell sat for Cambridge; and again in the Long Parliament as an active supporter of the popular and Puritan cause. He was never a parliamentarian in the ordinary sense of the word.

When the English Civil War began, his opportunity came. He fought at Edgehill (1642), and there perceived the weakness of the parliamentary levies against the spirit and dash of the royalist cavaliers. He saw that a counter-motive was required to meet the gallant traditions inspiring the king's soldiers, and this he found in the stern plainness of the English yeoman. He organized his famous cavalry regiments from this class, and at Marston Moor (1644) demonstrated the superiority of his troops, and stood forth as the greatest English military leader of the time—a fact which he showed again at Newbury (1644), Naseby (1645), Preston (1648), Dunbar (1650), Worcester (1651)—though the Scots general Leslie excelled him in strategy.

Cromwell attached himself early to the extreme and independent party in the army and the state, and was their representative in their struggle with the Presbyterian Parliament, which, after Naseby, wished to disband the army. It is probable that Cromwell was moulded by circumstances rather than that he was himself the moulder of them. The execution of the king shocked all the moderate men; and after Cromwell's return from a ruthless expedition against the royalists in Ireland, he was summoned to Scotland, where Charles II. had been declared king by the whole nation. The 'crowning mercy' at Worcester (1651) followed his victory over the Scots at Dunbar, and the three kingdoms were at his feet.

His first troubles were with Parliament. The 'Rump,' the remnant of the Long Parliament, being recalcitrant, Cromwell wished to prolong its own existence, Cromwell summarily dissolved it. In Sept. 1653 he called a new parliament, which undertook the revival of the constitution and offered Cromwell the title of king. Cromwell refused, he was again installed as Lord-protector, but with his powers now legally defined. Early in the following year, however, he attempted to dissolve the house which had rejected the authority of the second chamber. Abroad his influence still increased reaching its full height after the victory of Dunbar in June, 1658.

But his mastery administration was not effected without severe strain, and upon the death of his favorite daughter, Elizabeth Claypole, in the beginning of August, 1658, his health began to fail him. Towards the end of the month he was confined to his room from a tertian fever, and on Sept. 3, 1658, died at Whitehall, in the sixtieth year of his age. He was buried in King Henry Church, in Westminster Abbey, and after the Restoration his body was taken up and hanged at Tyburn, the head being fixed on a pole at Westminster Abbey, and the remains buried under the gallows.

Cromwell as general, Cromwell was still greater as a civil ruler. He lived in a simple and retired way, like a private man, and was abstemious, temperate, indefatigably industrious, and exact in his official duties. He possessed extraordinary penetration and knowledge of human nature; and devised the boldest plans with a quickness equalled only by the decision with which he executed them. No obstacle deterred him; and he was never at a loss for expedients. Cool and reserved, he patiently waited for the favorable moment, and never failed to make the most of his religious views he was a tolerant Calvinist.

**References.**—Curley's *Cromwell's Letters and Speeches*; Harrison's *Cromwell*; Morley's *Cromwell*; *History of the Protectorate*; *History of the Commonwealth and Protectorate*; *Cromwell's Army*, and Knowsley's *Oliver Cromwell*. Cromwell's Protectorship was the last son of Oliver, but by the deaths of two elder brothers, Robert and Oliver, became his father's successor. The protector had been empowered to nominate his successor, an effort was made to train Richard to the work of government, but in 1659 he had to resign the protectorship when the forces of anarchy, both parliamentary and military, broke loose, finding himself unable to restrain them, and deep in debt, he abdicated in 1659.

**Cromwell, Thomas**, chief of Essex, English statesman, born about 1485. He was in the service of Wolsey for several years before the cardinal's ruin in 1526, and remained his steady friend in adversity. His fidelity to his patron, and his talents commended him to Henry VIII., who appointed him his secretary and spokesman in the house of commons. This made him the leader of the English reformation. He was created earl of Essex, received valuable estates from the spoils of the monasteries, and was the king's most powerful subject. But he had enemies, and in 1540 he was executed by order of his master, Henry VIII., by his promotion of the marriage with Anne of Cleves, with whom Henry was disgusted, he was beheaded.

**Cromwell, William Nelson**, lawyer; now senior of law firm of Sullivan & Cromwell; officer, director, and president of the American Steel Corporation in the United States. He perfected the details of the transfer of Panama canal to United States government.

**Cronje (kr'nj)**, Pietrus Arnoldus, Boer general, 1860-1897. He was a descendant of Huguenots in the western army of the South African republic; frustrated the Jameson raid at Krugersdorp, 1895; defeated the Boers at Paardeburg, the Marshal Lord Roberts, 1900; member of the executive council of the Transvaal republic; chief of the Boer army, 1900.

**Crookes (kr'ooks)**, Sir William, British chemist and physicist; proprietor and editor of *Chemical News*; president of the British association for the advancement of science, 1889; editor *Quarterly Review of Science*; born in 1832. Discoverer of thallium, a new element, 1861; radiant matter, 1870; radiant matter, 1870; discovery of the elements of gadolinite, etc., 1880; genesis of elements, 1887.

**Crosby (kr'sbi)**, Fanny (Mrs. Frances Jane Van Hooker), blind writer; popular hymns; born at Southey, N. Y., 1820. Wrote words to many songs for George F. Root, the composer. Her first hymn was written for William B. Bradbury.

**Crosby, Howard**, American clergyman and scholar, born at New York, 1841; graduated at the University of New York, 1861; 1862; of Greer, then, 1861-69; and at Rutgers College, New Brunswick, 1869-71; 1871-72; of the University of New York, 1872-81. In 1877 he was the leading organizer of the society for the prevention of crime.

**Crothers (kr'uthrs)**, Samuel McChord, Unitarian clergyman, author, was born at Oswego, Ill., 1857; a Military Academy, 1876; began his ministry at Union Theological Seminary, D. D.; Litt. D.; since 1904 at First Parish, Unitarian church, New York City, since 1907. With the University, Author: *The Gentle Reader*; *The Understanding Heart*; *The Pardoner's Wall*; *The*

**Crozier, William**, army officer, was born at Carrollton, Ohio, 1853; graduated from United States Military Academy, 1876; began his service in the United States army as an artillery officer, 1876; brigadier-general and chief of ordnance of United States army since 1907. With General Buffington invented the Buffington-Crozier disappearing gun carriage; invented the gun.

**Cruikshank (kr'ukshank)**, George, English artist, was born in London, 1792. His father and elder brother were both caricaturists. Like Hogarth, he was a moralist as well as an artist, and as a total abstainer he consecrated his art to length to the reformation, 1875; died at Garsington, Oxfordshire, 1878.

**Crumphacker, Edgar Dean**, lawyer, congressman, was born at New York, 1840; admitted to the bar in 1876, and has been in the practice of law at Valparaiso, Ind., since; member of the lower house of congress, 19th Indiana district, since 1897.

**Cruwvell, Charles Thomas**, English clergyman and scholar, son of a welder, Oxfordshire, was born at Peterborough cathedral, born in London, 1847; graduate of St. John's College, Oxford. Ordained to the ministry, 1873; died at Garsington, Oxfordshire, 1900-06.

**Cujas (k'ujas)**, Jacques, eminent French jurist, born in 1502, studied under Araud, a jurist at the University of Toulouse because professor of the Roman law at Bourges and Valence. Among his works are *Commentarius ad Justinian's Institutes*, and on the *Pandects and Decretals*. Cujas has been styled by Hallam the greatest of the French jurists.

**Culberson, Charles A.**, lawyer, United States senator, was born in Dadeville, Ala., 1855; studied law in New York; admitted to the bar, 1878; Virginia in 1876-77; elected attorney-general of Texas in 1880 and 1892; elected governor of Texas in 1890-91; elected United States senator, 1899, 1903 and 1911.

**Cullom, Shelby Moore**, lawyer, United States senator, was born at Carmichael, Pa., 1830. In 1853, was admitted to the bar, and began to practice law at Springfield, Ill.; was governor of Illinois in 1874-83; elected United States senator in 1883; and reelected in 1888, 1894, 1899, 1903 and 1911.

**Cummins, Albert Baird**, lawyer, United States senator, was born at Carmichael, Pa., 1830. LL. D.; studied law in office of McClellan & Hodges, Chicago. Admitted to Illinois bar, 1874. Member of Iowa legislature, 1883; governor of Iowa, 1902-04, 1904-06, 1906-08; elected 1908 to United States senate to serve out term of Illinois. Mr. Allison, deceased, reelected 1909 for the term 1909-15.

**Cunard (kr'nard)**, Sir Samuel, chief engineer, founder of the Cunard Line, born at Limerick, Ireland, 1793; came to America, 1817; acquired early as a merchant and shipowner, and removed to New York, 1820. He was born at Limerick, Ireland, 1793, the Royal Mail steam packet company, between Liverpool and Halifax, Boston, and Quebec. The first passage, 1840, was the *Briancon*, a fourteen days night homeward. Iron steamers were introduced in 1855, and paddle-wheels gave way entirely to the screw after 1862. Since then the Cunard line has been kept at the head of the leaders in transatlantic travel. Died 1865.

**Cunningham, Daniel John**, British physician, scientist, professor of anatomy in the University of Edinburgh, 1803, and of comparative anatomy; born at Crieff, Scotland, 1830. M. D., D. Sc., D. C. L., D. P. F. R. S.; has been examiner on anatomy, 1860, and anatomy, 1861. Editor of *London, Cambridge, Oxford, and Victoria*. Author: *Manual of Practical Anatomy*; *The Microscopic*

**Cunningham, William**, English clergyman, educator, archdeacon of Ely, was born at Edinburgh, 1849; received his B. A., and M. A., from the University, 1869; chaplain in Trinity College, 1880-91; Hulsean lecturer, 1885; visitor of Great St. Mary's, Cambridge, 1887-90. Editor of *Outlines of English Industrial History*; *Cure of Souls*; etc.

**Curie (Mad'rs), Madame**, see Marie Sklodowska. Polish chemist, and physicist, was born at Warsaw, Russia, 1867; educated at Warsaw, and at the Sorbonne, Paris; see D. Paris; she discovered the element polonium with her husband, Pierre Curie, the element radium.

**Curie, Pierre**, French chemist, was born in Paris, 1861; he discovered the element radium, a member of the French Academy of Sciences, 1903. He was killed by an accident, 1906.

**Curran (Cur'ran), John**, Irish legal and parliamentary orator, was born in County Cork, Ireland, 1756. He was educated at Trinity College, Dublin, and in 1773 went to London, and entered the Middle Temple. In 1782 he obtained a seat in the Irish parliament as member for Killybeggs, 1817.

**Curtin, Jeremiah**, American author, ethnologist, and linguist, was born at Milwaukee, Wis., 1841; graduated from Harvard, 1863; was secretary of legation at St. Petersburg, 1864-70; connected with the United States bureau of ethnology, 1883-91. Died 1906.

**Curtis, Benjamin Robbins**, American jurist, born in Massachusetts, 1809; graduated at Harvard, 1830. On the impeachment of Andrew Johnson, he appeared as one of the counsel for the defendant.

**Curtis, Charles**, American United States senator, was born at Topeka, Kan., 1860; member of Congress, 1887-91; elected to the United States senate from Kansas, 1907.

**Curtis, Cyrus H. K.**, publisher, was born in 1850, and was educated in the public schools of New England. He is now the head of the Curtis publishing company, publishers of the *Ladies' Home Journal* and the *Saturday Evening Post*.

**Curtis, George Thomas**, American lawyer and critic, was born in Massachusetts, 1812, graduated at Harvard, and began law practice in Boston, afterward returning to New York. He was several times in the Massachusetts legislature, and was for a time United States commissioner. His main books are *Rights of the Merchant Seaman*; *Treatise on the Law of Copyright*.

**Curtis, George William**, American journalist, newspaper publicist, was born at New York, R. I., 1824. He commenced the *Editor's Easy Chair* papers in *Harper's Monthly* in 1853, and was editor of the *Century* on its establishment in 1857. He died at New York, 1892. He wrote *Lotus-Eating*; *Postscript Papers*; *True and It*; etc.

**Curtis, William Elmer**, journalist, born in Akron, Ohio, 1850; graduate of Western Reserve College, Cleveland, 1872; *Record-Herald*, Cleveland, 1872-73; commissioner of Columbian exposition to Madrid, and special envoy to the queen regent of Spain, 1876; *Cape Lee*, 1891; *India*, 1891; *India*, 1891; *Zachariah Chandler*; *Bygones*, *Burma*, and the *British India*; etc.

**Curtius (Kurt'us-ernst)**, Ernst, German historian and archaeologist, was born 1814, at Lübeck; studied at Bonn, Göttingen, and Berlin. From 1853 a member of the academy of sciences; he was one of its permanent secretaries 1871-93. He died 1896.

**Curtius, Georg**, one of the greatest Greek scholars, was born at Lübeck, Germany, 1820, and studied at Bonn and Berlin. After teaching at Dresden and Berlin, he became in 1849 extraordinary, in 1851 ordinary, professor of classical philology at Prague, at Kiel in 1854, at Leipzig in 1862. He died 1885.

**Curtis (Kurt'us) of Kedleston, first Baron**, George Nathaniel, English statesman, author, was born to Kedleston, 1859; graduate of Oxford college, 1881; member of parliament, Lancashire, 1886-98; vicerey and governor-general of India, 1899-1904; lord warden of the Cinque Ports, 1904-05; *India*, 1905; *Central Asia*; *Peria* and the *Persian Question*.

**Cushing (Kush'ing), Caleb**, American lawyer and diplomatist, was born in 1813. He was a member of Congress, 1835-38. He signed the first treaty of the United States with China; in 1874 he was one of the counsel for the settlement of the "Albion" claims, a boundary dispute; and in 1874-75 was minister to Spain. Died 1879.

**Cushing, Frank Hamilton**, American ethnologist, was born at New Bedford, Mass., 1834; was the national museum of Washington, and in 1875 began making collections of Indian relics for the department of ethnology. Among his books, *Petiches*, etc. Died at Washington, 1900.

**Cushman (Cush'man), Charlotte Saunders**, American actress, was born at New Bedford, Mass., 1816-1876.

**Custer (Kus'ter), George Armstrong**, American soldier, was born at New Rumsey, near Boston Point in 1831, and served with distinction through the Civil war. As a cavalry commander in the West he was several times defeated in battle. He died on the 19th of May, 1876, he attacked 9,000 Sioux on the Little Big Horn, in Montana, and had his 1,100 men were all destroyed.

**Cuvier, Georges Chretien Leopold Dagobert Baron**, (Koo'vée-an), one of the greatest natural-

ists the world has produced, was born at Montbéliard, France, 1769. After finishing his education at Stuttgart, young Cuvier accepted the situation of tutor in a Protestant family in Normandy. The Abbe Texier, whom the troubles of the time had driven into exile, from the capital, attracted him by letter to Jussieu and Geoffroy. Several memoirs, written about this time, and transmitted to the latter, established his reputation, and procured his admission to two or three of the learned societies in Paris.

In 1800 he was appointed successor to Daubenton as professor of natural history at the college of France, and in 1818 he succeeded Cuvier in the chair of comparative anatomy at the Garden of Plants. From that time he devoted himself steadily to the studies which have immortalized his name. His *Leçons d'anatomie Comparée*, and the *Règne Animal*, in which the whole animal kingdom is arranged according to the organization of the beings of which it consists, have raised him to the pinnacle of scientific fame, and established him perhaps the first naturalist in the world after Linnaeus. His numerous works upon these subjects show a master mind in the study of nature, and extending that study to the study of paleontology, he has been enabled to render immense service to geology.

In 1842 he became president of the Academy of Sciences, and in the same year a correlation of forms in organized beings—that all the parts of each individual have mutual relations with each other, tending to produce one end, that of the existence of the being; that each living being has in its nature its own proper functions, and ought therefore to have forms appropriated for that function and that consequently the analogous parts of all animals have received modifications of form which enable them to be recognized—he was able to ascertain from the inspection of a single fossil bone, not only the family to which it ought to belong, but the genus to which it must be referred. Even the very species of animal was thus to be made out, and the restoration of its external form as it might have lived and died, became in his hands an object of serious scientific precision. His *Règne Animal* has been frequently translated, and forms the basis of all arrangements followed at the present time. It has been an object of great importance in the state; particularly those connected with educational institutions. Napoleon treated him with much consideration; Louis XVIII. and Charles X. advanced him to honor; and Louis Philippe raised him to the rank of a peer of the realm. He died 1832.

**References**.—*See* *Les Mémoires de Baron Cuvier*; *Cuvier's History of Geology*; *Thomson's Science of Life*; *Day's Naturalists*; *Duméril's Heroes of Science*.

**Cyrus the Great**, founder of the Persian monarchy, commonly called Cyrus the Elder, was born about 590 B. C. Putting himself at the head of his Persian troops, he advanced into Media and overthrew the forces of Astyages, 559 B. C. After consolidating his dominions, which was a work of some time, he proceeded to subvert the surrounding nations. The kingdom of Lydia first yielded, 546 B. C., and its king, the famous Croesus, fell into his power. Ultimately the whole of Asia Minor was subdued. But the crowning triumph of Cyrus was his capture of the city of Babylon, the seat of the Chaldean empire, 539 B. C.

Cyrus was young when he was in 424 B. C., son of Darius, and governor of the western province of Asia. He died after successfully fighting against his elder brother, Artaxerxes, he raised a large army, including about 12,000 Greek soldiers, and fought against him, but was defeated and slain at Cunaxa. His death conducted the retreat of the 10,000 surviving soldiers, 425 B. C.

**Dabney, Charles William**, educator, president of University of Cincinnati since 1904, was born in 1835; graduated from the University of Hampden-Sydney College, 1853; Ph. D., LL. D., 1855; was first to discover the phosphate deposits in North Carolina; was the first to make the present plan in establishing an industrial school at Raleigh, president of University of Tennessee, 1865-67; first assistant to the president of the State, 1865-67; member of many scientific and educational societies.

**Dal'gren (doh'gren), John Chalmers**, American surgeon, was born in Philadelphia, Pa., 1863;

graduated from University of Pennsylvania, scientific department, 1882; assistant surgeon, Jefferson hospital, 1887; demonstrator of surgery, Jefferson medical college, 1891; clinical professor of surgery, same college, 1903; professor of surgery, 1900. Surgeon to Philadelphia hospitals since 1893, to St. Joseph's hospital since 1900. Author of *Practical Surgery*. Edited *English edition of Zuckerkandl's Operative Surgery*, and new American edition of *Practical Surgery*.

**Daedens (doh'den), Herman Willem**, Dutch general, was born in 1762, died in 1818. He became colonel of a corps of 1,000, professor of surgery, 1793, and afterward brigadier-general. After the fall of Napoleon he was intrusted with the organization of the army of the Netherlands.

**Daguerre (dah'gair')**, Louis Jacques Mande, French inventor, was born in 1788. He discovered the daguerotype process of photography. He was also celebrated as a diorama painter; was named by the French government as an officer of legation of honor, 1863.

**Dahlgren (doh'gren), John Adolf**, American admiral, was born in Philadelphia, Pa., 1809. He became a midshipman, 1826, and lieutenant, 1837. Ten years afterward he began to experiment in the casting of heavy cannon for naval warfare, and finally devised the Dahlgren gun. He died in Washington, when in command of the navy yard, 1870.

**Dahlgren (doh'gren), Friedrich Christoph**, German historian, was born at Wismar, 1785; studied at Copenhagen and Halle, and in 1813 became a professor of history at the latter city. He received a professorship at Göttingen, where he published his valuable *Quellenkunde der deutschen Geschichte*. In 1842 he became professor at Bonn, and in the movement of 1848 headed the constitutional liberals. Died 1860.

**Dahn (doh), Ernst**, German publicist, historian, poet, was born at Hamburg, 1834, the son of the actor, Friedrich Dahn. He studied at Munich and Berlin. In 1872 became professor of German jurisprudence at Königsberg, and in 1888 at Breslau.

**Dal'gren (doh'gren), John**, was born at Harper's Ferry, Va., 1839; studied drawing and painting in New York with private teacher and at art student's league. First exhibited at National academy of design, 1880; studied in Europe, 1897; commenced to paint the Lady Chapel of the church of St. Mary and New York, 1900.

**Dalberg-Acton (doh'ber-act'oon), Sir John Emerich Edward**, first Baron Acton, English statesman, was born at London, 1814. In 1895 he was made professor of modern history at Cambridge University, and in 1902 he became a peer of the realm. He died 1902.

**D'Albert (doh'al'bert), Eugene Francis Charles**, dramatist and novelist, was born at London, 1857; studied first in London, afterward under Franz List in Weimar. Visited the United States several times, and was in 1891 in New York. He was made professor of modern history at Cambridge University, and in 1902 he became a peer of the realm. He died 1902.

**Dale, Alan**, pseudonym of Alfred J. Cohen, dramatist, critic, author, was born in Birmingham, England, 1867. He was educated at the University of London, and Oxford University. Came to United States, and resided in journalism in New York; dramatic critic of *New York Evening World*, 1897-98; dramatic critic of *New York Journal* since 1898. **D'Alembert**. *See* **Alembert**.

**Dalhousie (doh'hoose), James Andrew Broun Ramsay**, Marquis of, British statesman, was born at Middleton, Scotland, 1812. He distinguished himself in parliament, and won credit many important posts, and in 1847 proceeded to India as the youngest governor-general ever appointed to that country. He died in 1860.

**Dall (doh), Caroline Healey**, author, was born in Boston, Mass., 1822; daughter of Mark and Caroline Foster; married in 1841 to the Rev. Dr. L. L. D. Alfred University, 1877; vice-principal of Miss English's school, Georgetown, D. C., 1842-43.

**Dallas (doh'das), Alexander James**, American statesman, was born in the island of Jamaica in 1759; died in 1817. He was secretary of the treasury and acting secretary of war, and superintended the reduction of the army after peace had been declared.

**Dallas, George Millin**, American statesman and diplomatist, was born at Philadelphia, Pa., 1792. During 1831-32 he represented Pennsylvania in the United States senate; and minister to England, 1856-61. He died in 1864.

**Dalton (doh'ton), William**, British chemist and physicist, was born near Cockerham in 1766. He was famous for his experiments on the elastic force of steam. Died 1844.

**D'Alembert (dah'el-ber'te), Count Gombert**, member and secretary of the Prussian senate; professor at the University of Brussels, 1780; minister of Brussels, 1846; educated at Brussels and Paris. Late rector of the University of Brussels; long time director of the *Revue de Belgique*.

**Dalzell (dah'zell), John**, congressman, lawyer, born in New York City, 1826; graduated at Union College, 1846; admitted to bar, 1867; member of congress since 1867.

**Damen de (dah'men de), Joseph**, Roman Catholic missionary, was born near Louvain, Belgium, 1840. He long worked single-handed for the cause of the oppressed, and was joined by other priests. For twelve years he

escaped the contagion; but in 1585 the malady appeared in him, yet he continued his labors until his death in 1589.

**Damrosch** (*dám'rosh*), **Walter Johannes**, composer and musical director, was born in Breslau, Prussia, in 1852; received his musical education under his father and Riechert, Urspruch, and Hans von Bülow; came to United States with his father, 1871. Succeeded his father as conductor of the New York symphony society, 1885; founded the Damrosch opera company, 1894; elected conductor of New York Philharmonic Society, 1897. He wrote *The Scarlet Letter*, opera in three acts; *Cyranus*, opera in four acts, songs, etc.

**Dana** (*dá-ná*), **James**, American journalist, was born at Hindsdale, N. H., 1819. From 1846 to 1862 he was managing editor of the *New York Tribune*, and from 1862 to 1870 he was managing editor of the *New York Sun*. In 1867 he founded the *New York Sun*, and began the successful management of the paper on democratic lines. He died on Long Island, 1897.

**Dana**, **Edward Salisbury**, mineralogist, educator, was born in New Haven, Conn., 1849; graduated from Yale, 1870; Ph. D., 1876; professor of physics, Yale, since 1890; trustee of Peabody Museum since 1883; editor *American Journal of Science* since 1875. Author: *Text-book of Mineralogy*; *Text-book of Elementary Mineralogy*; *Dana's System of Mineralogy*; *Mineralogy for Students*, etc.

**Dana, Francis**, American poet and diplomat, was born in Massachusetts; studied at Harvard; graduated, and admitted to the bar in 1767; was a member of the congress of 1777, which formulated the articles of confederation; was a member of the senate supreme court, 1785; chief justice, 1791-1806.

**Dana, James Dwight**, essential geologist, educator, was born at Uxbridge, N. H., 1813; graduated at Yale, 1833; professor of natural history and geology at Yale College, 1845-95. Died at New Haven, Conn., 1895.

**Dana, John Cotton**, librarian, was born at Woodstock, Vt., 1855, and graduated from Dartmouth, 1878; studied law, Woodstock, 1878-81; became a lawyer, Colorado, 1881-83; admitted to New York bar, 1883; President of American library association, 1896.

**Dana, Paul**, editor, was born in New York, 1852; graduated from Harvard, 1874; Columbia law school, 1878. Became assistant editor of the *New York Sun*, 1880, of which his father was editor, and on the death of the latter, 1897, succeeded him as editor, retired in 1903.

**Dana, Richard Henry**, American poet and prose writer, was born at Cambridge, Mass., 1787. In 1818 he became associated with the *North American Review*, to which he contributed largely. His *Dying Raven*, *The Buccaneer*, and some other of his poems were warmly praised, but Dana's best work was in criticism. He died at Boston, 1879.

**Dana, Richard Henry, Jr.**, lawyer and author, son of the preceding, was born at Cambridge, Mass., 1818. He entered Harvard college in 1836, but suspended his studies on account of the weakness of his eyes in 1834. He then shipped as a common sailor on a voyage to California, of which he wrote a narrative entitled *Two Years Before the Mast*. He was one of the founders of the free soil party in 1848. Died in Rome, Italy, 1862.

**Dandolo** (*dán'dó-lo*), **Enrico**, doge of Venice, was born about 1108 or 1108 A. D. When the emperor Alexius, who had been raised to the throne by the exertions of Dandolo, was murdered by his own subjects, Dandolo laid siege to Constantinople, and took it by storm, 1204. He died in 1208 in Constantinople, and was buried in the church of St. Sophia.

**Dane** (*dán*), **Nathan**, American lawyer, was born in Massachusetts, 1752. He served in the continental congress, 1785-88; framed the ordinance for the Northwest territory, 1789; was prohibited slavery, and was United States senator, 1794-98. Died at Haverly, Mass., 1835.

**Daniel**, **John Warwick**, English statesman and senator, was born in Lymington, W. S., 1812; educated at Lymington College and Dr. Gesner Harrison's university school; studied law, University of Virginia, 1865-66; admitted to bar, 1866. Member of Virginia house of delegates, 1869-72; of state senate, 1875-81; member of congress, 1885-87; United States senator 1887-1910. Died 1910.

**Danewacker** (*dán'ek-ter*), **Johann Heinrich von**, German sculptor, was born near Stuttgart, 1758, and educated by the duke of Württemberg, who had become his patron; he became the first sculptor in the academy at Stuttgart; his earlier subjects were from the Greek mythology, and his later Christian. Died 1826.

**D'Annunzio** (*dán-nú'n-zio*), **Gabriele**, Italian poet, novelist, and dramatist, born in Pescara, Italy, educated at the College of Frosinone, University of Rome; studied law in Pisa, but in 1885 took up literature. Author: *The Child of Pleasure*; *The Voyage of Eros*; *The Triumph of Death*; *The Dead City*; *The Flame of Life*, etc.

**Dante, Alighieri**, foremost among Italian poets, and one of the greatest that the world has ever produced, was born at Florence in 1265. He was educated at the Universities of Bologna and Padua, and at a later period,

while in Paris, applied himself to the study of theology. He fought in the victorious battle of Campaldino against the Aretines in 1300, and took an active part in storming the fortress of Capraia 1290.

Having been twice entrusted with an embassy, he was chosen one of the prior, or chief-magistrates of Florence, in 1300, when the struggle between the Guelphs and the Ghibellines was at its height. Dante espoused the cause of the Guelphs, or Imperialists, who, being the weakest numerically, were overthrown by the Ghibellines, and the Guelphic leaders were banished and their property confiscated. Dante shared their fate and left his native city, never to return. For many years he was doomed to bear the sorrows and hardships of an exile. In 1304 he left Verona, and went to Paris.

When the Emperor Henry VII. invaded Italy, Dante returned to Verona, and employed his powerful pen to further the imperial cause. It was probably at this time 1310 that he wrote the work *De Monarchia*. The fruitless struggle between the emperor and the pope, and the Emperor 1313 demolished his last hope, and he spent the remaining years of his life under the kind protection of Guido Novello da Volterra, one of the foremost statesmen of Italy. Many cities of Northern and central Italy claim the honor of having harbored Dante within their walls. His remains were buried in a chapel of the *Frati Minori* in Ravenna. They were, however, subsequently removed, and in 1865 were discovered in the Braccioforte Sepulchral Chapel of the same city. In 1830 only, a marble cenotaph was consecrated to his memory in the church of Santa Croce at Florence.

When about 9 years old, Dante beheld, for the first time, Beatrice Portinari, then 8 years of age, and the love then kindled in the heart of the tender boy remained forever the inspiration of his life. How pure and chaste this passion was, may be seen from the poet's first work, *Vita Nuova*, which is consecrated to a collection of poems referring to his early love; each of these poems is accompanied by a history of its origin, and accurate analysis. Beatrice was married to the noble Florentine Simone de' Bardi, and died at an early age. A few years after her death, Dante married the daughter of an old and noble family, by whom he had six or seven children.

In his work *De Monarchia* he advocated the supremacy of the emperor in temporal, and that of the Pope in spiritual affairs. He wrote several other works in Latin, besides many canzonets, sonnets, and lyrics in Italian; most of the latter were collected in his *Convito*. But his greatest work is the *Divine Comedy*. The best English translations of the complete poem are those of Cary, and of Longfellow.

**References**.—Symonds's *Introduction to the Study of Dante*; Rossetti's *A Shadow of Dante*; Gardner's *Dante Primer*; Butler's *Dante*; *The Works of Dante*; *Handbook of Dante*; *His Times*; Toyne's *Dictionary of Proper Names and Noble Matters in the Works of Dante*; *Fay's Dante*, and *Quint's Dante*.

**Danon** (*dán'ón*), **Georges Jacques**, French revolutionist, was born at Arcis-sur-Aube, France, in 1759. A zealous devotee of naturalism, he used all his influence to hasten the execution of the king; and subsequently, as the president of the *Revolution*, appeared anonymously in 1792, and other revolutionary leaders to establish that fatal tribunal under whose authority so many sanguinary judgments were pronounced. He was cruel, however, with *Rubespierre*, and by that very tribunal which he himself had established, he was executed, and guillotined in 1794.

**D'Arbly** (*dán'blá*), **Frances Burney**, English novelist; born at Lynn Regis, England, 1752. From the age of eighteen to twenty-six she worked as a governess, appeared on the stage, and won her fame. In 1793 she married General D'Arbly, a French refugee. Her last works are *Camilla*, *The Wanderer*, and the *Memoirs of her father*. Died at Bath, England, 1840.

**Darius** (*dán'us*), king of Persia, was born in the city of Hyrcanus, and was the son of the usurper, and became king of Persia in 521, in succession to Cambyses. He captured Babylon after a siege of twenty months, and destroyed the city, and defeated the Scythians. He died in 486 B. C.

**Darius III., Codomannus**, the last ruler of the Persian empire, 336-330 B. C. At the battle of Arctium, in 334, he was defeated by Alexander, who had a host of more than 1,000,000 men, was completely routed. Darius fled to Ecbatana, where he collected a new army. Alexander pursued him thither, but before he came up with him Darius was assassinated by Bessus, satrap of Bactria, 330 B. C.

**Darley** (*dár'li*), **Felix O. C.**, American artist, was born in New York, 1824. Though a painter in water, he is especially known for his work as an illustrator. Some of the finest figures and scenes in the *Fortunio* series, and the *Longstone* lithograph on the men of the *Farm Islands*, are recollections of the survivors of the wreck of the *Fortunio* steamer, September 7, 1868.

**Darling, Grace**, born, 1818; died, 1842. With the exception of Fuller, no other woman has been in the Longstone lithograph on the men of the *Farm Islands*, are recollections of the survivors of the wreck of the *Fortunio* steamer, September 7, 1868.

**Darley** (*dár'li*), **Lord, Henry Stuart**, husband of Mary, queen of Scots, the eldest son of the earl of Lennox by Lady Margaret Douglas, was born in England, 1545, where also he was educated. He is interesting chiefly on account of the position which he occupied with respect to his wife, and his tragic end in 1567. He was father of James I. of England.

**Darrow, Clarence S.**, lawyer and socialist, was born in Kingston, N. Y., 1834. He was admitted to the bar, 1875. Elected to Illinois legislature, 1902. Active in political campaigns as independent candidate for governor, 1892, and 1900. He has a large number of labor injunction and labor conspiracy cases on side of labor.

**Darwin, Charles**, English naturalist, was born at Shrewsbury in 1809, died at Down, near Beckenham in Kent 1882. He was educated at the Universities of Edinburgh and Cambridge.

He early devoted himself to the study of natural history, and, in 1831, was appointed naturalist to the surveying voyage of H.M.S. *Beagle*. The vessel sailed in 1831, and did not return till 1836, after having circumnavigated the globe. Mr. Darwin came home with rich stores of knowledge, part of which he soon gave to the public in various works. In 1839 he married his cousin Emma Wedgwood, and succeeded to the position of country gentleman, engrossed in scientific pursuits—experimenting, observing, recording, reflecting, and generalising.

He published his *Life and Writings of Resources during a Voyage round the World*; in 1844 *Structure and Distribution of Coral Reefs*; in 1844 *Geological Observations on Volcanic Islands*, etc.; in 1845 *Geological Observations on the Mountains of Scotland*; in 1845 his first *Sketch of the Zoonoidea*, and soon after the *Fossil Lepidosaurs and Batrachians of Great Britain*. In 1859 his name attained its great celebrity by the publication of *The Origin of Species by Means of Natural Selection*. This work, scouted and derided though it was at first in certain quarters, may be said to have worked nothing less than a revolution in biological science. In it for the first time was given a full exposition of the theory of evolution as applied to plants and animals, the origin of species being explained on the hypothesis of natural selection.

The rest of his works are largely based on the material he had accumulated for the elaboration of this great theory. His principal works are: *The Power of the Fertile Soil* (1842); *Descent of Man and Variation in Relation to Sex* (1871); *The Expression of the Emotions in Man and Animals* (1872); *Movements and Habits of Climbing Plants* (1875); *Insectivorous Plants* (1875); *Cross and Self Fertilization* (1876); *The Power of Movement in Plants* (1878); *The Power of Growth of Vegetable Mould* (1881); the last containing a vast amount of information in regard to the common earth-worm. Mr. Darwin was buried in Westminster Abbey.

**References**.—Widdowson's critical annotations by T. H. Huxley, A. A. Gray, J. G. Thompson, St. G. Mivart and E. D. Cope; and *Life and Letters of Darwin*, by Charles Fox Parry.

**Darwin, Erasmus**, English poet and physician; born in Eithan near Newark, England, 1731. He studied at Cambridge, obtained a degree in medicine at Edinburgh, in 1755, and settled at Lichfield as a physician. He died in 1802.

**D'Arbly** (*dán'blá*), **Frances Burney**, see *D'Arbly*.

**Daubigny** (*dáub'ny*), **Charles**, **Francçois**, French landscape painter, was born in Paris, 1817. He was made chevalier of the legion of honor, 1857. Died 1878.



**Alonso, France;** he accompanied Lafayette to America in 1777. He was then appointed a major-general by congress in 1780. He died in New Jersey and Maryland, and was killed in command to General Gates. He was killed in the battle of Camden, 1780.

**De Koren (dā-kō'ren), Henry Louis Reginald,** American composer, was born in Middletown, Conn., 1861; graduated at Yale in 1885. He has served as musical critic on various New York publications. His operas are: *The Beguine*; *Don Quixote*; *Robin Hood*; *The Rose Tree*; *Swan Song*; *Student King*; *The Snowman*; etc. He has written also a large number of songs and various music for the stage.

**Delacroix (dā-lā'kroix), Ferdinand Victor Eugene,** French painter, chief of the romantic school, was born near Paris, 1798. He studied at the École des Beaux-Arts in Paris. In 1822 his first work, *Death and Victory*, attracted much attention. In 1830 he was elected by the institute to fill the place of Paul Delarocche. He died in 1855.

**Delambre (dā-lā'mbr'), Jean Baptiste Joseph,** famous French astronomer, was born at Amiens, 1749, and studied first under Delisle, and afterward under Lalande. After the discovery of the planet Uranus in 1781, he composed tables of its motion. In 1802 he was appointed inspector-general of education. He died in 1822.

**Deland (dā-lā'nd), Margaretta Wade, nee Campbell,** American writer, was born at Allegheny, Pa., 1837; educated at private schools, and married, 1860, Loria F. Deland. Her books are: *Arthur Ward, Preacher*; *The Old Garden and Other Verses*; *Dr. Lander's People*; *The Common Way*. The *Illustration of Helen Rector*.

**De la Rampe (dā-lā-rā'mp'), Louise** (better known by her pen name "Gaula"), English novelist of French extraction, was born at St. Edmunds, England, in 1840. Her first novel, *Granville d'Ugna*, appeared in book form in 1863, and was followed by numerous others. She has written many plays of European society. Among her stories are: *Under Two Flags*; *Held in Bondage*; *Shadows*; *The Little Duke*; *The Duke's Daughter*, and *Santa Barbara*. She died in Italy, 1908.

**Delarocche (dā-lā'rō'che), Paul,** French historical painter, was born at Paris in 1797; died in 1856. He studied under Watteau and Gros. Many of his subjects are drawn from French history, and they are usually of a somber character.

**Delarocche (dā-lā'rō'che), Theophile,** French statesman, was born in Pamiers, France, 1832; educated in Paris, and began his career as a journalist. He was elected to the Chamber of Deputies in 1859, for Foix. He has always been a consistent advocate of colonial expansion; foreign minister when M. Waldeck-Rousseau succeeded M. Dupuy, and when M. Combes, in 1902, succeeded M. Waldeck-Rousseau; visited England with the president in 1903, and with Lord Lansdowne prepared the Anglo-French agreement, signed in 1904. The difficulty with Germany about Morocco caused his retirement in 1905.

**Deille (dā-lā'ill), Jacques,** French poet, was born in Auvergne, France, 1738. He was educated at the College de Mazarin in Paris, and obtained a professorship in Amiens. The revolution compelled Deille to leave France, and he traveled in Switzerland and Germany, and then in London occupied eighteen months in translating *Paradise Lost*. Blind in his old age, he died in 1813.

**De Marigny, Charles,** French statesman, was born at Paris, 1793. He was elected to the Chamber of Deputies in 1830, for Foix. He has always been a consistent advocate of colonial expansion; foreign minister when M. Waldeck-Rousseau succeeded M. Dupuy, and when M. Combes, in 1902, succeeded M. Waldeck-Rousseau; visited England with the president in 1903, and with Lord Lansdowne prepared the Anglo-French agreement, signed in 1904. The difficulty with Germany about Morocco caused his retirement in 1905.

**De Meille (dā-lā'ill), Jacques,** French poet, was born in Auvergne, France, 1738. He was educated at the College de Mazarin in Paris, and obtained a professorship in Amiens. The revolution compelled Deille to leave France, and he traveled in Switzerland and Germany, and then in London occupied eighteen months in translating *Paradise Lost*. Blind in his old age, he died in 1813.

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He labored to get all the Greeks to combine against the encroachments of Philip, but their want of patriotism and Macedonian gold frustrated his efforts. He was present at the battle of Chaeroneia (380 B. C.), in which the Athenians and Boeotians were defeated by Philip, and Greek liberty crushed.

After the death of Alexander in 336 Demosthenes tried to stir up a general rising against the Macedonians, but Alexander at once adopted measures of extreme severity, and Athens sued for mercy. It was with difficulty that Demosthenes escaped being delivered up to the conqueror. In 324 he was imprisoned on a false charge of having received a bribe from one of Alexander's generals, but managed to escape into exile. On the death of Alexander near the year he was recalled, but the defeat of the Greeks by Antipater caused him to seek refuge in the temple of Poseidon, in the island of Calauria. He was taken from there, and being himself to escape from the emissaries of Antipater (322 B. C.).

The character of Demosthenes is by most modern readers considered as one of the greatest in history. His fame as an orator is equal to that of Homer as a poet. Cicero pronounces him to be the most perfect of all orators. He carried Greek prose to a degree of perfection which has never before been reached. Everything in his speeches is natural, vigorous, concise, symmetrical. We have under his name sixty-one orations, some of which are admitted to be the greatest of the kind indeed enemy—of Demosthenes as an orator was Aeschines.

**References.**—Pintarch's *Life of Demosthenes*; *Journal of Antiquaries*, Ser. 2, vol. 1, p. 183; *His Time*; *Blam's Demosthenes*; and *Butcher's Demosthenes*.

**Deane, Charles Samuel,** lawyer, public official, was born in Edwardsville, Ill., 1830; graduated from McKendree College, 1852; studied law, and was admitted to the bar in 1855. He moved to Illinois house of representatives, 1852; served one term as attorney for sanitary district, 1857; state attorney, 1858; U. S. attorney, 1860-1864; governor of Illinois, 1904-13.

**Dewey, Chauncey Mitchell,** lawyer, United States senator, was born in Albany, N. Y., 1834; was graduated at Yale College in 1850; studied law, and was admitted to the bar in 1855; L. D., 1857. He was member of the New York Central railroad in 1860; general counsel of the United States senate, 1869, and reelected, 1905. He has an international reputation as an expert.

**De Quincy, Thomas,** English essayist, born in Manchester, England, in 1755. In 1803 he entered Worcester College, Oxford, which he left without a degree, and soon after became acquainted with Coleridge and Wordsworth, took a notice at Grasmere, and became a member of the famous "Lake school." He had acquired the habit of taking opium by using it to cure an attack of neuritis, and so greatly did it grow upon him that he was known to take as many as 12,000 drops, equal to ten wineglasses, in a day. He was engaged in preparing fourth volume of his works for the press within a few days of his death. Died 1830.

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Alexander I. In 1903 he retired to private life, and gave himself up to poetry. Died 1916.

**Descartes (dā-kā'rtes), René,** great French philosopher and mathematician, was born, 1596, at La Haye, in Touraine. He was educated at the Jesuit College of La Fleche, where he showed great talent. He entered the military profession, and was killed in the battle of La Bataille in 1621. In 1621 he left the army, and after a variety of travels finally settled in Holland, and devoted himself to philosophical inquiries.

Descartes, seeing the errors and inconsistencies in which other philosophers had involved themselves, determined to build up a new system of philosophy, by divesting himself first of all the beliefs he had acquired by education or otherwise, and resolving to accept as true only what could stand the test of reason. Proceeding in this way he wrote *Meditationes Prima Philosophiae* in which he first enunciated that he could not doubt or divert himself of belief in himself as a thinking being, and this ultimate certainty he expressed in the celebrated phrase *Cogito, ergo sum* "I think, therefore I am."

Here, then, he believed he had found the true truth. Starting from this point Descartes sought the same kind of truth in such propositions as these; that the thinking being or soul differs from the body (whose existence consists in space and extension) by its simplicity and immateriality and by the freedom that pertains to it; that every perception of the soul is not distinct; that it is so far an imperfect finite being; that this imperfection of its own leads it to the idea of an absolutely perfect being; and from this last idea he deduces all further knowledge of the truth.

Descartes also contributed greatly to the advancement of mathematics and physics. The higher departments of geometry were greatly extended by him. His system of the universe attracted great attention in his time, though long since exploded. It rested on the hypothesis of a vortex, and immense currents of ethereal matter, by which he accounted for the motion of the planets (*Principia Philosophiae*, 1644). His work excited a great revolution in the principles and methods of philosophizing. In 1647 the French court granted him a pension of 3000 livres, and two years later, on the invitation of Christian of Sweden, he went to Stockholm, where he died, 1650.

**References.**—Fisher's *Descartes and his School*; Mahaffy's *Descartes*; Smith's *Studies in the Cartesian Philosophy*; Descartes' *Discourse on Method* and the *Meditations* are translated by Veitch.

**Desmoulins (dā-mō'lan'), Benedict Camille,** French revolutionist, was born at Guise, France, in 1760; studied law at the University of Caen, and was a man of great talent. He was a deputy to the convention in 1793, but his companions sent him to the guillotine in 1794.

**De Soto (dā-sō'to), Hernando,** Spanish explorer, born about 1500, followed the path of Cortez and Pizarro, under the latter of whom he served in Peru. About 1536 he was made governor of Florida, and was expelled from the country, which resulted in the discovery of the Mississippi. Died of fever in Louisiana about 1542.

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New York, since 1896; Schiff professor of social economy, Columbia University, since 1903. Author: *Economics: Their Principles and History*; *The Principles of Relief*; *Economic and Political History*.

**De Vinne (dē vin'), Theodore Low**, printer, and designer, was born in New York, 1829; learned printer's trade. He has been in the improvement of typography, and received an honorary M. A. from both Columbia and Yale Universities.

**Dewar (dē'ar), Sir James**, British scientist, Fulbright professor of chemistry, University of London; was born in Kinross, Scotland, 1842; D. Sc., Oxford. With Sir Frederick Abel he investigated the properties of gunpowder and of solidly hydrogen. Received French Academy's Lavoisier gold medal in 1894. Knighted, 1904.

**De Wet (dē wēt), Christian Rudolph, Boer general**, was born in 1858. He had acquired fame as a hunter before he became conspicuous in the Transvaal war of 1895-97, and in the Boer war of 1899-1902 he was one of the Boer commanders the most audacious, swift in movement, and fertile in expedients.

**De Witte (dē wīt'), Wilhelm Martin Leberecht**, German biblical critic, born at Ulla, near Weimar, 1780. He studied from 1799 at Jena, and became professor at Heidelberg in 1807; in 1810 at Berlin, and in 1822 at Basel, Switzerland, where he died. His reputation rests on his *Introduction to the Old Testament*.

**Dewey, George**, admiral in United States navy; born in Montpelier, Vt., 1813; appointed to naval academy, September 22, 1834; was promoted to sea passed midshipman, L.L.D., 1836; in Farragut's fleet, and served the Pacific. He was promoted to the rank of captain in 1862. He was afterward on several vessels in the North Atlantic blockading expedition, then in European squadron, and later on various duty stations, being promoted to commodore, 1872; captain, 1873; commodore, 1874. In January, 1898, assumed command of Asiatic squadron. On May 1, 1898, in Manila bay, destroyed the Spanish Asiatic squadron, and captured the Spanish fleet, destroying eleven and capturing all the vessels and all the land batteries, without the loss of a man on the American side. He received the receipt of official news of victory he was promoted to rear admiral, and thanked by resolution of congress promoted to admiral in 1900.

**Dewey, John**, educator, professor of philosophy, Columbia University, since 1904; was born at Burlington, Vt., 1859; graduated, University of Vermont, 1879; Ph.D., Johns Hopkins University, 1882. Was professor of University of Minnesota, 1882-89; University of Michigan, 1889-94; and professor of philosophy and psychology, Columbia University, 1894-1904. Author: *Psychology*; *Logic*; *Critical Theory of Ethics*; etc.

**Dewey, Melvin**, librarian, was born in Adams Center, N. Y., 1881; graduated, Amherst, 1874; librarian, 1902. Acting librarian, 1903. Was chief librarian and professor of library economy, Columbia College, 1898-98. Founder and director, New York state library school, 1897-1900; state director of libraries, New York, 1904-06. Author: *Library School Rules*; *Descent Classification and Relative Index*.

**De Witt (dē wīt'), Jan**, Dutch statesman, was born at Durt, 1625. He was a friend of De Witt, a vehement opponent of William II. Prince of Orange, in 1654, on the conclusion of the war with England, a secret article was inserted in the treaty drawn up between De Witt and Cromwell. In virtue of which the house of Orange was to be deprived of all state offices. The Orange party carried their point in the elevation of William to the family and dignity of stadtholder. His brother, John, successor, accused of conspiracy with the king of the stadtholder, was imprisoned and tortured. De Witt went to see him on his release. As they were coming out of prison they were attacked and murdered, 1672.

**De Young, Michael Barry**, journalist, was born in St. Louis, Mo., 1848; removed to California with parents when five years the younger brother Charles he established, 1865, *The Dramatic Chronicle*, later changing it to the *San Francisco Chronicle* and projector and director, at the California mid-winter exposition, 1893-94; member of executive committee for relief and red cross funds.

**Diaz (dē'az), Blas**, Spanish explorer and navigator, flourished in the fifteenth century. Driven by a violent storm, he sailed round the eastern extremity of Africa, and discovered the Gulf of Guinea, without immediately realizing the fact, and discovered Africa bay. Was lost in a storm, May, 1500.

**Diaz, Porfirio**, Mexican statesman, president of Mexico, was born at Oaxaca in 1830. He studied law and was an officer in the Mexican army and the United States. In 1876 he rebelled and overthrew the president, Lerdo de Tejada, and he himself made president. He was twice elected. He was elected again in 1894, 1898, 1899, 1899, 1904, and his administration was greatly popular under his administration, and he was elected for a high place among the world's great reformers. Foreworded in *Spain*, 1901.

**Diaz de la Peña (dē'az dē la pē'ñā)**, Narcisse Virgile, French statesman, was born at Bordeaux

of Spanish parentage, 1807. Left dependent, he was educated by a Protestant pastor at Bellevue, near Paris. In 1831 he began to exhibit in the French Academy. He died at Meudon, 1876.

**Dickey (dī'kē), Albert Venn**, British lawyer and writer, (literary professor of English law at Oxford since 1892) was born in 1825; graduated in the Balliol College, Oxford; M.A., hon. D.C.L., Oxford; hon. LL.D., Cambridge, Glasgow, and Edinburgh; was a student law and was made a barrister of the Inner Temple, 1863.

**Dickens, Charles**, English novelist and humorist, was born in England, he died at Meudon, 1876. He began a literary apprenticeship on *The True Sun*. He attached himself to the staff of the *London Chronicle*, and he was the first to visit the United States. He published, in 1842, his *American Notes for General Circulation*, but a much more admirable result of his visit to the United States was his *Sketches*, particularly the greatest of his humorous works since the *Pickwick Papers*; *Black House*; *Hard Times*; *Little Dorrit*; *The Tale of Two Cities*; *Great Expectations*; *Our Mutual Friend*, and other novels equally celebrated succeeded one another with almost periodical punctuality, and an audience larger than any English author ever had awaited each. In 1850 he commenced a weekly periodical entitled *Household Words*, afterward merged in *All the Year Round*. In 1857 he again visited the United States, gave numerous readings, and met with a brilliant reception. He was again the last engaged in writing a new novel, *The Mystery of Edwin Drood*, which was left unfinished at his death in 1870.

**Dickinson, Dea M.**, lawyer, was born at Port Ontario, N. Y., 1846; removed to Michigan in 1862. Graduated from the law department of the University of Michigan in 1866, and since 1867 has been a practicing lawyer in the West, and a Wisconsin circuit judge, and was master-general of the United States, 1887-90. Member of many legal, municipal, financial, and other associations.

**Dickinson, Jacob McGovick**, lawyer, secretary of war, was born in Columbus, Mass., in 1851; studied law at the University of Michigan, and studied law at Columbia College, New York, in Paris, and at the University of Leipzig; LL.D., University of New York, 1890. He was professor of law at the University of Illinois; was assistant attorney-general of the United States, 1895-97. He became secretary of war in 1900.

**Dicksee, Francis Bernard**, English painter and royal academicien, was born in London in 1853. He studied at the Royal Academy, London, 1870. First exhibited at academy, 1876.

**Diderot (dē'drō), Denis**, celebrated French encyclopedist, was born at Langres, France, 1713. His great work was the *Encyclopedie*, begun in 1740, of which he and 150 members were the joint editors. He died in 1784.

**Diekmann (dē'kman), Frederick**, American artist, was born in New York, 1857. He was admitted to United States in childhood; graduated at Calvert College. He has been president of the National Academy of Design since 1899; member of art commission, New York, 1901-03; etc. Since 1903 he has been professor of descriptive geometry and drawing in the College of the City of New York.

**Dike (dīk), Lt. Hon. Sir Charles Wentworth**, English statesman and writer, was born at Chelsea, near London, 1843. He was graduated at Cambridge, studied law and is a barrister of the Middle Temple. Was under-secretary of state for foreign affairs, 1880-82; chairman of royal commission for housing of the working-class, 1884-85; chairman of a committee on lunacy, 1885-86.

**Dill, James Brooks**, lawyer, jurist, was born at Spencerport, N. Y., 1854; graduated at Yale University, 1876. He was admitted to the bar, 1878; for many years a noted corporation lawyer; since 1905 judge of court of New York, New York.

**Dillmann (dū'lman), Christian Friedrich August**, German orientalist and theologian, was born in Wurtemberg, 1823. He studied in Tübingen. In 1854 he accepted a call to Kiel, where he became professor of oriental languages in 1860, but was transferred in 1864 to the chair of old testament exegesis at Gießen, which in 1869 he resigned to become Hagenberg's successor at Berlin.

**Dillon, John**, Irish politician and leader, was born in New York in 1831, and was educated at the National Academy, 1852. He studied in Tübingen. He distinguished himself by the violence of his language. From 1883 to 1885 he was absent from his life on account of ill-health, but in the latter year he was elected for East Mayo, and has since represented that constituency in parliament.

**Dimwiddle (dī-wid' or dī-wid'-d'), Robert**, governor of Virginia, was born in 1758, was born in England about 1690. His rule was despotic and was not successful, his ill-temper and avarice led to his overthrow in 1776. He was a Quaker. He was the first to suggest to the British board of trade the taxing of the colonies. He discerned the necessity of making liberty the basis of his adjustment-general of one of the four military districts of Virginia. He died in England in 1770.

**Diocletian (dē'okl'-at's), Valerius Diocletianus**, Roman emperor, was born in Dalmatia in 245, and reigned from 284 to 305. After the death of Numerian he was proclaimed emperor by the troops at Chalcidion. In the year 305, Diocletian, being born out of rank, resigned his position as emperor and was banished to Dalmatia, where he died eight years later. His reign has been memorable for the persecution of the Christians.

**Diogenes (dē'og'-ē's), philosopher of the school of cynicism**, was born at Sinope in Pontus. Becoming a citizen of Athens, he made himself notorious by his abnegation of all social laws, and lived in a tub, and was called a cynic, from his abode in a tub. He died at Corinth, 323 B. C.

**Dionysius (dē'ion'-i-s), the Elder**, tyrant of Syracuse, was born in Sicily, about 408 B. C. Not content with his military renown, he wrote poems and tragedies, and at one time gained a prize at Athens for the tragedy *The Rosamond of Hector*. He died at Syracuse in 367 B. C.

**Dionysius of Halicarnassus**, critic, historian, and rhetorician, was born about 130 B. C., went to Rome in 79 B. C., and died there about 7 B. C. His *Greek Antiquities*, a history of Rome down to 264 B. C., is a mine of information about its constitution, religion, history, laws, and private life of the Romans.

**Dismal (dē'zmal, dē'z-māl), Benjamin**, earl of Beaconsfield, eminent statesman and novelist, was born in London in 1804. He entered the House of Commons in 1829, and remained there until his elevation to the house of lords in 1876. In 1852, and again in 1858 and 1866, he was chairman of the select committee on the Derby, and carried the reform act of 1867. In 1868, on the retirement of Lord Derby, he was made premier, and in 1874 he was once more in office, which he held until again defeated by Gladstone in 1880. Lord Beaconsfield's career as an statesman and novelist was a brilliant career. His first novel, *Fusion Grey*, appeared in 1829, when he was little more than twenty-one years of age. His last novel, *Lord Dunsany*, appeared only a few months before his death. He died in London in 1881.

**Dix, John Adams**, American statesman and general, was born at Beacon, N. H., 1781; entered the army in 1812, and rose to the rank of adjutant-general in 1815. From 1835 he was successively secretary of state, United States senator, and secretary of the treasury. He became minister to France, 1860-69, and to Spain, 1870-71. He died in 1870.

**Dix, Margaret Fuller**, abolitionist, was born in New York in 1807; graduated from Columbia, 1848; B. D., General theological seminary, 1852; was a Unitarian minister, and author of *Doctrinal and Practical Lectures on the Authority of the Church*; *God Friday Address*; etc.

**Ditch, Joseph**, American statesman, was born at Snow Camp, N. C., 1807; graduated from Guilford College, North Carolina, 1829; was admitted to the bar, 1830. He was elected to the fifty-ninth and fifty-ninth congresses, and elected to the United States senate to succeed Hon. W. A. Clark for the term 1907-13.

**Ditch, Thomas, Jr.**, lecturer and author, was born in Shelby, N. C., 1844; graduated at Wake Forest College, N. C., 1863; Greenboro, N. C. Law School, 1869; admitted to bar, 1869; member of North Carolina legislature, 1881-86; resigned to enter Baptist ministry; pastor at Raleigh, N. C., 1887; Boston, 1888-90; New York, 1890-99.

**Doane (dō), Rt. Rev. William Croswell**, Protestant Episcopal clergyman, bishop of Albany, was born at Borton, Mass., 1832; graduated at Burlington College, N. J., 1850; D.D., LL.D., D.C.L.; established the *Antislavery Review*, 1854.

**Doane, Charles**, author of *Monks of the Harmony of the Collects*, *Epistles*, and *Gospels*, two volumes of *Addresses to the People*, 1870. He died in 1870.

**Dobson, Henry Austin**, English poet and man of letters, was born in 1840; educated at Coventry and Stroudham, and was a member of the literature. He contributed largely to the *Biographical of Great Artists*. Author: *Thomas Browne and His People*; *Four Enchanted*; *Robertson's Century Vignettes*; *A Palatine of Philanthropy*; *Sidekick*; *Stanzas*; etc.

**Dodge, Grenville Mott**, soldier, railway official, was born at Danvers, Mass., 1831; graduated C.E., Norwich University, Vermont, 1851; LL.D., 1890. He was engineer of the New England Rock Island road; brigadier-general of volunteers, 1864, and major-general of volunteers, 1864. He was a member of the Pennsylvania Railroad Pacific railway, 1871-81. Member of congress, second Iowa district, 1867-69. Succeeded General Sherman as president-in-chief of military order of United States Army.

**Dodge, Mary Abigail**, American writer, was born in Massachusetts, 1830; wrote several books of merit, and was the author of *Miss Maudslowi*. Died under the name de *plume* of "Gail Hamilton."

**Dodson, Alfred Robert Louis**, manufacturing chemist, was born in Baltimore, Md., 1867; graduated from Johns Hopkins University, 1886; Ph.D., 1890. He was a member of the Johns Hopkins University, medical department, 1901. In business as manufacturing chemist





entitled *The Ideal Life, Was the Ascent of Man*, in which he placed an altruistic element in the progress of evolution.

**Drummond, James**, British biblical scholar, principal of Manchester College, Oxford, 1880-1890; was born in Dundee, Scotland. He studied at Trinity College, Dublin, and Manchester New College, London; L.L. D., Litt. D., M. A., D. D., professor of theology, University of London, 1890; succeeded Dr. Martineau as principal, 1885; removed with the college to Oxford, 1890; retired, 1900. His chief works are: *Sermons on Christian Faith and Life*; *The Jewish Messiah*; *Introduction to the Study of Theology*; *Vindicta*; *Vindicta*.

**Druas (drü'au), Nero Claudius**, commonly called Druas Senior, stepson of the emperor Augustus, and younger brother of Caligula. He was born in 38 B. C. In 13 B. C. he was sent into Gaul, then in revolt, and, after crushing the rebels there, pushed across the Rhine to assist the German allies. From this time he made the business of his life to establish the Roman supremacy in Germany, partly by conquest, and partly by the execution of great military works. A fall from his horse cut short his brilliant career in 9 B. C.

**Dryden, John**, English poet, was born in Northamptonshire, 1631. After graduating at Cambridge, he entered upon a literary career. He succeeded Sir William Davenant as poet laureate in 1700. His essay on Dramatic Poets, according to Dr. Johnson, was the best of its kind in criticism. Dryden, by his dramas and political satires—especially his *Absalom and Achishole*—secured a high place among the poets of his time. He made numerous translations from the classics—especially Vergil, Juvenal, and Ovid—and wrote an elaborate treatise on the art of writing. Died, 1700.

**Du Barry (du bá'rí), Marie Jeanne Gonnard de**, French, Comtesse, favorite of Louis XV., was born in 1746, at Vaucouleurs, the daughter of a dragoon. Her influences reigned supreme until the death of Louis in 1793, when she was dismissed from court. She was tried before the revolutionary tribunal for having granted the measures of the state an undue influence for the late king, and was guillotined, 1793.

**Du Bois-Reymond (du böis'réymond), Emil**, German physiologist, was born in Berlin in 1818. His name is chiefly identified with animal electricity, the subject of his chief work, which won him a commandeur of the most modern scientists. Two volumes of his collected memoirs address a high place among the scientific works of his age.

**Du Bose, William Forcher**, Protestant Episcopal clergyman, was born in South Carolina, 1836. He was educated at the University of Virginia, S. T. D., D. C., L. D., and a while a student for the law. He entered the Episcopal ministry in the confederacy, 1861; became chaplain and professor, University of the South, 1871; after continuous service in the university, he resigned, 1880, and resigned active duties in the summer of 1908.

**Du Challu (du shá'lu), Paul Belloni**, American traveler, was born in Louisiana, 1835. In 1855 he sailed to West Africa, where he spent four years. His *Explorations in Equatorial Africa* gave important contributions to geographical, ethnological, and sociological science, but was received at first with much distrust. Died, 1903.

**Dodevant (dod'évánt), Aurora**, See **Madame de Buffon**.

**Dufferin (duf'érin), Frederick Temple Hamilton Blackwood, Marquis of**, British statesman, was born in Florence, Italy, 1826. He graduated from Christ Church, Oxford, and in 1841 succeeded to his father's title. In 1860 he became British commissioner in India. He served as under-secretary of state for India from 1864 until 1866, and later, for a short time, was under-secretary of war. From 1868 until 1872 he was ambassador of the duchy of Lanes; governor-general of Canada, 1878-79; ambassador to Russia, 1879-80; governor-general of Italy, 1880-81; ambassador to Italy, 1881-91; and ambassador to France, 1891-96. He was made an earl in 1871. Died, 1902.

**Du Guéclin (du g'éclin), Bertrand**, See **Guesclin**.

**Dumas (dú'má), Alexandre**, the Elder, French novelist and dramatist, was born in Villers-Cotteret, 1800, son of General Dumas, a Croix. His romances are numerous but he reached the climax of his fame in *Monte Cristo*, in 1844, and the *Three Musketeers* the year after.

He lived at Dieppe, broken in health and impaired in intellect, ministered to by his son and daughter. Died, 1870.

**Dumas, Alexandre, the Younger**, was born in 1824. He was a son of the preceding, and, like him, a novelist and dramatist. He accompanied his father on a voyage to the Mediterranean in 1846, and in 1845 produced the work which made his reputation *Le Dernier des Comédiens*. He quickly his work was chiefly dramatic, and includes such plays as *Le Demi-Monde*, *La Cécile*, *Georges*, *Le Dernier des Comédiens*, and *Le Dernier des Comédiens*. He was admitted to the French Academy. Died, 1883.

**Dumas, Jean Baptiste**, distinguished French chemist, was born in 1782. He was appointed tutor in the polytechnic school, at Paris, and then

professor of chemistry in the Ecole de Médecine. His researches in organic chemistry, on atomic weights, and on the action of acids on organic substances attracted the attention of all Europe. In 1848 he was a member of the legislative assembly, and in 1849 he held the office of agriculture and commerce. Died, 1864.

**Du Maurier (du mó'rí), George Louis Palmella**, French novelist and dramatist, was born in Paris in 1834; educated in London, Belgium, and the Netherlands. For many years a valuable contributor to the French press, he published a novel, *Pater Isidore*, followed by *Trilby* in 1894. Died, 1900.

**Du Moutier (du mó'tí), Charles François**, French general, was born at Cambria, 1739; entered the army in 1757, and served in Germany during the Seven Years' war. In 1792 he overthrew the Austrians under the duke of Saxe-Teschen and Clairault at Jemappes; but as Napoleon was sustained a severe defeat from the Austrians under Coburg, with whom he entered into a plot to restore the monarchy. He fled to his military treason, however, reached the government at Paris, and an order of arrest was issued against him. This he succeeded in evading, and escaped across the border. He died an exile at Turville Park, near Henley-upon-Thames, 1823.

**Duncker (dún'kér), Maximilian Wolfgang**, German historical writer, was born at Berlin 1811. He became professor of history at Halle in 1842; was a member of the Prussian Academy of Sciences in the Prussian chamber, 1849-52; was called to a Tubingen chair in 1857, and thence recalled in 1860 to fill a post in the ministry of state. Died, 1880.

**Dundonald (dún-dón'ad), Thomas Cochrane**, British naval officer, was born in England in 1775. Entering the navy when a boy, he early distinguished himself by the destruction of the Spanish fleet in the Bay of Cádiz, 1805. In 1823, having offered his services to Brazil in her war against Portugal, he swept the Portuguese Brazilian waters in 1824, and was afterwards named the Greek navy in the war of independence. He died in 1860.

**Dunlop (dún'lóp), Robert**, medical professor and author, was born in England in 1768. Was professor of materia medica and therapeutics in the University of Edinburgh, 1806-18, and of the institutes of medicine in Jefferson Medical College, Philadelphia, 1830-68. He translated the number of the *Encyclopædia Britannica* published about twenty original volumes. Died, 1869.

**Dunlop (dún'lóp), Finley Peter**, journalist, author, was born in Chicago, 1867; educated in Chicago public schools; entered newspaper life as reporter, was editor of the *Chicago Tribune*, 1890-91; *The Herald*, 1892-97; editor *Chicago Journal*, 1897-1900. Author: *My Dooley in France* and *My Dooley in Italy*. Editor of *The Dooley's Opinions*; *Observations* by *Mr. Dooley*, etc.

**Dunlop (dún'lóp), Archibald**, Scottish educator, professor of history, Columbia University, since 1891, was born in Plainfield, N. J.; graduated from Columbia, S. T. D., L. D.; was managing editor of *Political Science Quarterly*, 1894-1903.

**Dunois (dún'wá), Jean, Count of Dunois and Longueville**, was born in Paris, 1402, the natural son of Louis d'Orléans, brother of Charles VI. His first great achievement was the defeat of the English at Montargis, 1427. In 1429 Dunois and the maid of Orléans won the battle of Patay. Shortly after Joan's tragical death, Dunois took Chartres, the key of Paris, forced Bedford to raise the siege of Lagry, chased the enemy from Paris, and soon deprived them of all their conquests except Normandy and Guernsey. He was killed at the battle of Tewkesbury, 1471.

**Duns Scotus (dún'skót), John**, famous Franciscan monk and divine, was born about 1265. He appears to have been educated at Oxford, where in 1301 he became professor of theology. Duns Scotus was one of the most important of the Franciscan school, and was a chief opponent of the teachings of the Dominicans, the two parties representing at that time two opposite schools of theology.

**Dunstan (dún'stón), Saint**, English prelate, was born in 925, died in 988. Under saint's name he wielded great influence. He was made archbishop of Canterbury in 959 by Edgar, whom he crowned, ruled the kingdom with Edgar, and Edward to the throne, but on the accession of Edward his power was broken.

**Du Pont, Henry Algeron**, United States senator, was born in Delaware, near Wilmington, 1801; graduated at West Point, 1821, at head of class, and served throughout the civil war, in which he was in the ranks of colonel. United States senator, 1906, for the term 1906-11.

**Dupont, Samuel Francis**, American rear-admiral, was born at Bergen Point, N. J., 1833. In the summer of 1861 he was given command of the Atlantic blockading squadron. He also commanded the expedition which captured the Royal harbor of the same year. He received his command in 1863, and died at Philadelphia in 1864.

**Dupré (dú'pré), Jules**, celebrated French painter, was born in 1812. He excels as a landscape

painter, and his work is noted for its refined poetic taste as well as for its bold and vigorous drawing. He died in 1889.

**Duquesne (dú'dák'), Abraham**, Marquis-François, French officer, was born at Dieppe, 1673-43. He was killed at the battle of La Hogue, 1759, and was with Spain. He defeated De Ruyter and Van Tromp several times, 1673-74, and was named Baron of the Holy Roman Empire, and Sicily in 1676. Died, 1688.

**Durer (dú'rér), Albrecht**, German artist, was born in Nuremberg, 1471. He was apprenticed to a painter in his native town, and some years later began designing on wood, engraving on copper, and painting. He succeeded to Venice, and after his return painted in Adam and Eve, and Assumption of the Virgin, etc. He died in 1528. Besides being the founder of the German school of art, Durer ranks even higher as an engraver on metal and designer of woodcuts.

**Duse (dú'sé), Eleonora**, Italian actress, was born in Vigevano, 1810. She appeared about 1830 on the Italian, chiefly the Roman stage, as leading lady in the plays of Dumas and Sardou, but afterward played parts of greater depth. Her latest successes are *D'Annunzio's Giocanda* and *Francesca da Rimini*.

**Dvornik (dú'vórnik), Antonín**, composer, was born at Mulhaus, Bohemia, 1841. Brahms introduced his compositions to Vienna; but the work was not successful. He was in London, 1880, where he met *Stasch Mair*, which was first performed in London in 1883. In 1892-95 he was director of the conservatory of New York. He was a composer of an symphony. He subsequently lived at Prague, where he died in 1904.

**Dwight, Theodore William**, jurist, professor, and author, was born in 1822 at Castile, N. Y.; graduated at Hamilton College, 1840, and studied at Yale Law School. In 1858 he was chosen professor of municipal law of the Columbia College. In 1874 he was appointed by Governor Dix, of New York, a judge of the commission of appeals. Died, 1900.

**Dwight, Timothy**, educator, theologian, was born at Northampton, Mass., 1752; graduated from Yale in 1773. He was president of Greenfield Hill, Conn., 1783, where he also successfully conducted an academy. In 1791 he was elected president of Yale College, which position he held until his death. Died, 1817.

**Eadie (é'ád), John**, theologian, was born at Northampton, Conn., 1828; grandson of the above; graduated from Yale, 1849; D. D., L. D., studied theology at Yale, 1850-51; was president of Yale University, 1856-69; member of American committee for revision of English version of the Bible, 1870-71; was president of the Inner Life, *Memories of Yale Life and Men*. Eadie (é'ád), John, British clergyman and writer, was born at Glasgow, 1818. He was minister of the Glasgow United Presbyterian congregation, from 1843. He also acted as minister of the college of his church. Died at Glasgow, 1876.

**Eadi (é'ád), James Buchanan**, American engineer, was born at Lausanneburg, Ind., 1830. He constructed the steel bridge over the Mississippi river at St. Louis, completed in 1874; partly carried out a plan of deepening the Mississippi by means of jetties. Died, 1887.

**Eames (é'am), Emma**, American prima donna soprano, was born at Shanghai, China, of American parents, 1867. Made her debut at the Paris grand opera, 1889; Covent Garden, London, in role of *Charlotte in Faust*, 1891. She resides chiefly at Torre de Campiollon Vollobrosa, Italy.

**Eaton, George H., Jr.**, banker, lawyer, manufacturer, was born in Philadelphia, Pa., 1856; graduated from Harvard, 1879; A. M., 1904; was admitted to the bar in 1879. He was president of the Finsere Company of Pennsylvania at Philadelphia; is active in a number of other financial institutions.

**Early, John**, American statesman, was born at South Devon, 1824; was educated at Magdalen hall, Oxford, and became professor of Anglo-Saxon at Oxford, 1849-54, and again at Freemanburg from 1876. Among his books are: *The Philosophy of the English Tongue*; *Anglo-Saxon Literature*, etc. Died at Oxford, 1903.

**Early, Jubal Anderson**, soldier and lawyer, was born in Virginia, 1816; was graduated at the United States Military Academy, at West Point, 1837. He was in the army during the Mexican war, and opening of the civil war he was appointed a colonel in the confederate army; was promoted brigadier-general in 1863, commander of the 2nd Virginia Infantry, and was killed at the battle of Gettysburg, 1863, after which he was relieved of his command. He subsequently practiced law in Virginia. Died, 1894.

**East, Alfred**, English landscape painter and etcher, was born at Kerrier, Cornwall, 1812. He was an admirer of the government architect, Sir George Gilbert Scott, and was a member of the Royal Academy of the Royal Society of British artists.

**Eastlake, John Ruskin**, English landscape painter, was born at Plymouth, 1793. From 1806 he studied under Haydon, in the Royal Academy schools,

and was elected a member of the Royal Academy in 1825.

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and in Paris. When the *Bellerophon* put into Plymouth, Eastman's number of rapid sketches from a short-bolt, and produced two full-length portraits of Napoleon. He died at New York, 1866.

**Eastman, George**, inventor, was born in Waterbury, N. Y., 1854; was educated in Rochester and New York; first in the photography business; began to manufacture dry plates on small scale, 1880; inventor of the kodak, and entered extensively into the business of photography and general management of Eastman Kodak company.

**Eaton, Arthur Wentworth Hamilton**, Protestant Episcopal clergyman, was born in Kentville, Nova Scotia; graduated from Harvard, 1880; D. C. L., Ordained deacon, 1884; priest, 1885; New York; first in the Episcopal ministry; then Hill, Mass., 1885-86. Author: *The Heart of the Cross*; *Historical Religion in the Light of Modern Thought*; *Andronicus and Junia*.

**Eaton, Wyatt**, American artist, was born at Phillipsburg, Canada, 1849. He studied in New York, and in Paris with Léon Bonnat, spending some years in study, sketching and traveling in France and England; he opened a studio in New York; was one of the founders and the first secretary of the society of American artists. Died at Newport, R. I., 1906.

**Eber** (cf. *Evil*), **Werner Moritz**, German novelist and Egyptologist, was born at Berlin, 1837; studied jurisprudence at Göttingen, and oriental languages and archaeology at Bonn; in 1861 he was made professor of Egyptology at Leipzig. He died at Tutzing Bavaria, 1896.

**Eberhard-Sachsenhausen** (cf. *Evil*), **Marie**, baroness von, Austrian novelist and poet, was born in Moravia, 1830. Since 1848 she has lived principally in Vienna. In 1870 she received the pension of the emperor. She is the foremost German woman writer of the day.

**Eck** (cf. *Evil*), **Johann Maler von**, German monk and theologian, was born at Eck, in Swabia, 1486. He was the son of a peasant, but raised himself by his abilities to the professorship of theology in the University of Ingolstadt. He took a prominent part in opposition to Luther in the Diet at Augsburg, 1530, and in the conference of Worms and Ratibon, 1540 and 1541. Died 1543.

**Eckermann** (cf. *Evil*), **Johann Peter**, German writer and literary executor of Goethe, was born in Wismar, Germany, 1792. The publication of his *Goethe and Goethe's Works* in 1829 led to Weimar, where he assisted Goethe in preparing the final edition of his works. Died, 1854.

**Edin**, **Mary Baker Glover**, religious writer, founder of Christian Science, was born in Bow, N. H., 1823. She received a public school education, and was converted to Christianity in 1840. Her church until 1866, when she formulated what are known as the principles of Christian Science. In 1867 she has been called the founder of the church of Christ in Boston, Mass. In 1863 started the *Christian Science Journal*. She is the author of *God's Kingdom*, *My Key to the Scriptures*, the *Christian Science textbook*; *Manual of the Mother Church*, and other works on related subjects. In 1906 Mrs. Edin gave \$1,000,000 for the establishment of a Christian Science institution for the promotion of the welfare of mankind. In 1907 she was decorated by the French government as an officer d'academie. Died 1910, Boston.

**Edson, Robert**, actor, was born at Baltimore, Md., 1868. He was educated in the public schools at Brooklyn, N. Y., and made his first appearance on the stage in *Eden* at the Park theater, New York, 1897. Later he appeared in *A. M. O. P.*, *The Dark Secret*, *Jack*, and *Under the Red Rose*. He has also acted in *The Climbers*; *Soldiers of Fortune*; *Stronach*, *The Classroom*.

**Edgeworth, Maria**, English novelist, was born at Enniscorthy, 1767. She began to write fiction early in the nineteenth century, and was previously taken an interest in educational topics. Her chief books treat mainly of the virtues and duties of humanity with a high moral aim. Died in Ireland, 1849.

**Edison, Thomas Alva**, celebrated American inventor, was born in Milan, Ohio, 1847. He has invented many telegraphic appliances, including automatic repeater, quadruplex telegraph, etc. Established Edison Electric Co., removed to Menlo Park, N. J., 1876, and later to West Orange, N. J. Was made chevalier, officer, and grand officer of the Legion of Honor by the French government; was given the honorary degree of Ph. D. by Union University, 1878, and has been variously honored by numerous scientific, educational, and other bodies.

**Edmund, or Edmund**, king of the English, known as *Ironside*, was born at Winchester, 1042. Son of Ethelred "the Unready," and was chosen king by the Londoners on his father's death, 1066. A compromise with Canute, king of the Danes, Mercia and Northumbria, Edmund all the South and the leadership, the survivor to succeed to the throne. A few weeks afterward Edmund died, 1066.

**Edmunds, George Franklin**, American lawyer and statesman, was born at New York, 1816. Removed to Burlington, 1851; was a member of the state legislature 1854-60; took his seat in the

United States senate as a republican from Vermont, 1861. He was re-elected 1875, 1881, 1887, and succeeded Vice-president Arthur as president pro tem. of the senate after the death of Charles Sumner, 1881. He was a member of the movement of associate justice of the United States supreme court, 1882; elected president pro tem. of the senate, 1882, and was a member of the committee on the manner in which electoral votes for president should be counted, 1886. His recognized authority in 1891, and has since practiced law in Philadelphia.

**Edward, or Edward**, "the confessor," king of the English, was born in 1042, and succeeded his father, Edward the Confessor, in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

**Edward I**, king of England, was born in 1239, succeeded his father, Henry III, in 1272. Imbued with high notions of feudal sovereignty, he sought to establish his supremacy throughout the island of Britain. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

**Edward II**, king of England, was born in 1307, the son of Edward I, was born at Carnarvon, 1327. In 1301 he was created prince of Wales, being the first prince of Wales to be created as such. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

**Edward III**, king of England, eldest son of Edward II, and Isabella of France, was born in 1312. He succeeded his father, Edward II, in 1327. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

**Edward IV**, king of England, was born in 1469, the son of Richard, Duke of York, led a force into London during the reign of Henry VI, and was crowned king by parliament while Henry VI was still alive. In 1474 Edward formed an alliance with the duke of Burgundy, and made preparations for the war in support of his claim to the throne of France. He passed over to Calais, but the expedition proved fruitless through the devotion of his ally Charles the Bold of Burgundy, with whom the kingdom was to have been divided. During the latter part of his life Edward was sunk in indolence and pleasure. He left five daughters, of whom Elizabeth was afterward married to Henry VIII, and two sons, the ill-fated prince Edward and Richard. Died, 1483.

**Edward VI**, king of England, son of Henry VIII, and Jane Seymour, was born at Greenwich, 1537. He succeeded to the throne at his father's death in 1547, his uncle, the cardinal of Hertford, being regent and protector. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

**Edward VII**, king of the united kingdom of Great Britain and Ireland, was born at Windsor, 1841. He succeeded to the throne at his father's death in 1901. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

**Edward, the Black Prince**, eldest son of Edward III, was born at Windsor, 1312. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

he fought at Crécy, and is said to have won from him his last enemy, the Duke of Burgundy, and married his cousin, Joan, the "fair maid of Kent," who bore him two sons, Edward and the future Richard III. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

**Edwards, Amos**, born in London, 1831. He published a volume of *Ballads*, and another of *Love Songs*, and was a member of the Dolomite, *A Thousand Miles up the Nile*, in 1877. He died at Weston-super-Mare, 1892.

**Edwards, Julian**, American composer, was born in Manchester, N. H., 1854. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066. He was a pious and just ruler, and his reign was marked by the "unready" was brought up at the Norman court, and after his accession, on the death of his father, he was crowned king in 1066.

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**Freytag (fré'tak), Gustav**, German novelist and dramatist writer, was born in Silesia, 1816. He studied at Breslau and Bonn. He was a pioneer in German literature in the University at Breslau. He wrote poems, successful plays, and novels. His best-known work is *Die Hochzeiten*. He has appeared in several English translations. He died at Wiesbaden, 1895.

**Friedrich (fré'drich), Heinrich**, philanthropist, was born in West Overton, Pa., 1849. Was president, and since 1897 chairman of board of directors of H. C. Frick coal company; organized coke producer in the world, operating nearly 40,000 acres of coal and 12,000 coke ovens, with capacity of 25,000 tons of coke weekly.

**Frobisher (fró'tshir or fró'tshir), Sir Martin**, famous English navigator, was born near Doncaster about 1535. He was a seaman, and was persuaded that there was a northwest passage to the Indies, and after many fruitless efforts to sell the merchandise in his cause, he obtained in 1576 from the government of Queen Elizabeth three vessels, explored portions of the Arctic coast, and, passing through the strait which has since borne his name, he returned to England and was knighted. Died 1594.

**Froebel (fró'bél), Friedrich Wilhelm**, founder of the famous kindergarten system, was born at Oberweisbach Germany, 1782. He founded a kindergarten at Blankenburg in 1827. His system was founded on that of Pestalozzi—under whom he worked from 1807 to 1809—which combined religious, moral, and domestic training, beginning with the years of childhood. Died 1852.

**Frohman, Charles**, theatrical manager, was born at Sandusky, Ohio, 1850. He was educated in the public schools of New York. In 1885 he saw *Hamlet* at Boston, and brought it to the city, and bought rights to that play, outside of Boston; made a great success with that and several venturing to London. Died 1900.

**Frohman, Daniel**, theatrical manager, was born at Sandusky, Ohio, 1853. Manager of Fifth Avenue theater and Madison Square theater, New York, 1879-80. He was in 1887. He entered since 1885; manager of Daly's theater, New York, and Daniel Frohman stock company. President of Actors' fund of America.

**Fromentin (fró'mén'tin), Eugène**, French painter and author, was born at La Rochelle, France, 1820. He was a pupil of Rémond and Cabat; studied in 1842-43 in Algeria. He painted in the East, and was made an officer of the legion of honor, 1859. Died 1878.

**Fromont (fró'món't), Eug.**, (fró't-mál), Louis de Boudé, Comte de, French colonial officer, governor of Canada, was born in 1621. He was in the French army, and was appointed governor of the French possessions in North America. He died at Quebec, 1693.

**Frost (fró'st), Arthur**, dramatist, was born at Philadelphia, Pa., 1851. He was self-taught in art, and exhibited at the Paris exposition, 1900. Author: *Red Call and Other Tales*, *Golfers' Alphabet*; etc. He lives chiefly in France.

**Frothingham, Arthur Lincoln, Jr.**, university professor, was born at Boston, 1839. Educated at the Royal University, Rome, 1875-81; M. A., Ph. D., University of Leipzig, 1883. Professor of archaeology and history of art, 1887-98, ancient history and archaeology, since 1898, Princeton University. Author: *A History of Sculpture*; *Medieval Art*; *Introduction of the Papyrus*. Author and reviewer of the departments of architecture, art and archaeology in the *New International Encyclopedia* and many contributions to the *Journal of American*, *English*, French and Italian periodicals.

**Frothingham (fró'thíng'm), Octavius Brooks**, clergyman and author, was born at Boston, Mass., 1810. He was graduated at Harvard in 1833, and became pastor of a Unitarian church in Salem, Mass. In 1855 he removed to New Jersey, and came to New York City, where he was minister of an independent religious organization for twenty years. Died 1895.

**Frothingham, Paul Stevens**, clergyman, author, was born at Jamaica Plain, Mass., 1864. He was graduated from Harvard, 1886, Harvard divinity school, 1890; pastor at Harvard in 1893, and University, 1899-1902; minister of Arlington Street church, Boston, since 1900. Author: *What Every Christian*; *The Christian's Life*, etc. **Frode (fró'd), James Anthony**, eminent English historian and general writer, professor of history at Oxford from 1874; he died, was born at Darlington, England, 1818. He was educated at Balliol College, Oxford. In literature his best known works are those of the *Crutwell* family, and *Bræmese*. His accuracy has been greatly underrated in detail, but his style is terse and simple, and power of presenting broad facts have secured for his histories great influence and popularity. Died 1901.

**Fry, Sir Edward**, English lawyer and jurist, was born at Bristol, England, 1827. He was educated at Bristol College, and at the Inner Temple, and lord justice of appeal, 1883-92; presided over the royal commission on the Irish land acts, 1892; appointed a Privy Councillor, 1893; and first British plenipotentiary to The Hague peace conference, 1907.

**Fry, Elizabeth**, English philanthropist, was born near Norfolk, 1790, daughter of John Gurney, a Quaker. She was married to a Quaker, and was part of Great Britain and on the continent, everywhere effecting ameliorations. She died at Bath, England, 1845.

**Fry, William Fries**, lawyer, United States senator from Maine since 1881, was born in Lewiston, Me., 1828. He was graduated from Bowdoin college, 1850; LL.D., 1889; LL.D., Bates, 1881; member of congress, 1871-81; elected United States senator in 1881, and re-elected in 1887 and 1889-1912. President pro tem, during Roosevelt's administration, and reelected in 1907.

**Fryer (fré'yer), John**, professor of languages and literature, University of California since 1896, was born at Hythe, Kent, England, 1859; graduated from Bowdoin College, 1882; LL.D., LL.D.; general editor and chairman of executive committee of educational association of China, 1887-96; hon. secretary of Chinese Polytechnic institution, Shanghai, since 1870. Author: *Educational Directory for China*; *Translator's Vocabulary*; or *Vocabulary of Scientific Terms in Chinese and English*, etc.

**Führich (fré'k), Joseph von**, Austrian painter, was born at Krattitz, Bohemia, 1800. He became professor of painting in the academy of Vienna, and painted many scriptural subjects. Died 1869.

**Fukushima (fú'kú-shí-mé), Baron**, Japanese general, was born at Matsuzono, 1853. General of the 1st division, 4th division, and chief of administrative bureau of territory occupied by Japan during war with China, in command of the 1st division, until 1904. He was attached to General Yamaguchi, then to Field-Marshal Oyama, and was chief of staff during Boxer troubles, 1900-04; general staff officer during Russo-Japanese war, 1904-05; general staff officer, General Kojima's army, 1906; second staff of the army, 1906.

**Fulford (fú'fórd), John**, portrait, and landscape painter, was born at Derrifield, Mass., 1822. He studied in Boston, New York, London, and Paris. He painted his first picture in 1837. Had notable exhibits at Boston and New York, 1876 and 1878, respectively. Died 1880.

**Fuller, Melville Weston**, chief-justice of the United States supreme court, was born in Augusta, Me., 1793. He was graduated from Bowdoin college in 1815, and attended a course of lectures at Harvard law school; LL.D. He became chief-justice of the United States supreme court, and chancellor of Smithsonian institution; chairman of trustees of Peabody education fund; member of the board of directors of the Smithsonian institution; member of the board of directors of the Museum of Natural History, 1905. Died 1910.

**Fulton (fú'lton), Robert**, inventor, was born at Little Britain, Pa., 1765. He was received as a civil engineer in 1798, and wrote a work on canals in which he developed his ideas. Accepting an invitation from the United States minister at Paris, he proceeded to that city in 1790, and remained there for seven years, during which he made his project a reality. In 1803 he constructed a small steamboat, and his experiments with it on the Seine were attended with success. He returned to America in 1807 and pursued his experiments there. In 1807 he launched his steam-vessel, the *Clermont*, upon the Hudson, which made a successful voyage in the presence of thousands of astonished spectators. In 1815 he launched the war-steamer *Fulton*, and died the same year.

**Funk, Isaac Kaufman**, author, publisher, clergyman, was born at Clifton, Ohio, 1839. He was graduated at Wittenberg College; D. D., 1886; LL.D., 1890; editor-in-chief of *Standard Dictionary*; entered into partnership with A. W. Nagels in 1876, merged into the Funk and Wagnalls company, 1900. Author: *The Next Step in Evolution*; *Practical Bible*; *Mite and Gnat*; *Psychic Science*, etc. **Funston, Fred**, brigadier-general United States army, was born in Ohio, 1865. He studied in the United States army; was captain, major, and lieutenant-colonel in the infantry; was in Cuba, 1896; served eighteen months; was wounded; was in the United States army; was in the 20th Kansas volunteers, 1868; went to Philippines; took part in several battles; for crossing the strait between Luzon and Mindanao, he was made in face of heavy fire and establishing rope ferry, by means of which the United States troops were sent to Mindanao, and was promoted to brigadier-general of United States volunteers, 1898. Continued in active service in the Philippines, and was promoted to major, and died in the Philippines, and was appointed brigadier-

general of United States army, 1901; commandant army service school, Ft. Leavenworth, Kan., 1906. **Furness (fú'furness), Edward**, writer, editor, Shakespearean scholar, was born in Philadelphia, Pa., 1833; graduated from Harvard, 1854; Ph.D., University of Halle, 1856; LL.D., University of Cambridge (England); LL.D., University of Pennsylvania, Harvard, Yale, 1901. Died, 1910. **Furness (fú'furness), John**, Shakespearean scholar, author, and lecturer, was born at Westford, 1824. Settled in London at nineteen; many years contributor to *Illustrated London News*, *Illustrated Black and White*; *Illustrated Sporting and Dramatic News*; and the principal magazines in England since 1850.

**Furnivall (fú'ni-vál), Frederick James**, English philologist, was born at Egham, Surrey, England, 1831. He was educated at the University College, London, and Trinity Hall, Cambridge, where he took his degree, 1854; M.A., Ph.D., Litt D. He devoted himself to English philology, and founded the Early English text society, 1843; the Chaucer society, 1868; the ballad society, 1868; and the New Shakespeare society, 1874; was active in starting the Browning society, 1881, and the Wycliffe society, 1882. He personally edited many works, chiefly through the medium of some one of the above societies; the most important being *Saint Gertrude*; *Roberts of Brunne's Handlyng Synne*; *Walter Scott's Minstrelsy of the Scottish Border*; *Reliquiae*; and *Loose Poems*; Bishop Percy's *Folio MS. of Ballads and Romances*. His most valuable work is *Early English Text Society's Canterbury Tales*, and the *Century Shakespeare*, in 10 volumes. Died 1910.

**Furze (fú'z), John**, English poet, was born at Zurich in 1741. He was at first a clergyman and writer of Zurich, visited England, afterward studied law in London, and died in 1778, and executed pictures for Boydell's *Shakespeare gallery*, 1800. Died 1823.

**Fuseli de (fú'sel), Lucien de d'Alençon**, Numa Denis, French historian, was born at Paris, 1830. He filled a number of offices at Alençon, Paris, and from 1875 at the Ecole Normale. He was the son of 1870 he turned his attention to history, though he had written previously *Chateaubriand* and *Fichte*. His first historical work, *La Cite*, was made to author famous. Member of the French Institute. Died 1889.

**Fyfe (fí), Charles Alan**, English historian, was born at Blackheath, England, 1848. In 1867 he took classical honors at Balliol college, Oxford, and was elected a fellow of University College. During the Franco-German war he was war correspondent for the *Standard*, and was in Paris during the commune. Died, 1892.

**Gabelius (gá'bél-ús), Hans Conon von der**, German philologist and linguist, was born at Göttingen, 1818. He was educated at the Universities of Leipzig and Göttingen. He furnished contributions to periodicals on the Moravian and Samoyed languages. Died 1874.

**Gade (gá'd), Niels Wilhelm**, Danish composer, was born at Copenhagen, 1817. He was a composer of many choral and solo productions. He was court organist at Copenhagen, and wrote several symphonies, overtures, and cantatas, as well as many choral and solo productions.

**Gadsden (gá'dsén), Christopher**, American patriot was born in Charleston, S. C., 1774. He was a member of the first continental congress, 1774, became brigadier-general during the revolution, and was lieutenant-governor of South Carolina at the time of the surrender of Charleston to Sir Henry Clinton in 1780. He died in 1805.

**Gadsden, James**, grandson of above, was born at Charleston, S. C., 1788. He served in the war of 1812 and against the Seminoles. In 1853 he was appointed minister to Mexico, and negotiated the purchase of the Gadsden land, and was known as the "Gadsden purchase." He died in 1858.

**Gage, Simon Henry**, biologist, educator, was born at New York, 1810. He was educated at Cornell; studied at Cornell; instructor, assistant professor, and full professor of Cornell from 1878; studied in Europe, 1889-90. He was one of the editors of *American Journal of Anatomy*.

**Gage, Thomas**, English general, last royal governor of Massachusetts, was born in 1721. He was made commander-in-chief of the British forces in America. In 1774 he was nominated governor of Massachusetts at the height of the difficulties. On June 17th the battle of Bunker Hill was fought, which resulted in a costly victory to the English, but numerous complaints being lodged against Gage, he was recalled by British government in October, 1775. Died, 1787.

**Gagern (gá'gér), Heinrich Wilhelm August**, German statesman, was born at Balwerg, Germany, 1799. He was a member of the diet of Bavaria at Munich. In 1821 he entered political life under the government of the Duke of Bavaria. In 1832 he was elected to the diet of the state governments and of the federal diet. In 1846 he published a book against the government of Rome. Died 1880.

**Gailor, Thomas Frank**, prelate, bishop of Tennessee, was born at Nashville, Tenn., 1810. He was graduated at Racine College, and the General theological seminary, New York; D.D., S.T.D. He became a prominent member of the University of the South, 1882, and chaplain 1883; vice-chancellor of university, 1890-93.

**Galsbolghor (gar'v'v'v)**, Thomas, eminent English landscape painter, was born at Sudbury, England, 1727. His later genius found adequate expression in the delineation of the rich and quiet scenery of his native valleys, but he can be said to have mainly devoted himself after settling in London in 1774. At the creation of the Royal Academy he was chosen one of the first. He died in 1780.

**Gairdner (gair'ner)**, James, British historian, was born at Edinburgh, England, 1828. He was educated at the University of Edinburgh; L.L.D., Edinburgh, 1867; edited the *Panion Letters*, 1872-73; has edited also several volumes for the Cambridge Society; author of *England in the series Early Chronology of Europe*.

**Gaius (gai'us)**, Caius, Roman jurist, flourished in the second century of our era. He was the author of more than fifteen works, of which the *Institutes* was the most important. He died in 180.

**Gaib (gai'ib)**, Servius Sulpicius, Roman emperor, was born B. C. 3. He was commander of the army in Spain when the emperor Nero died, in 69 A. D., and was so popular with the soldiers that they made him emperor when seventy-one years old. He was murdered after a reign of only seven months, in 69 A. D.

**Gaizide (gai'zide)**, Benito Pérez, Spanish novelist and dramatist, was born in the Canary Islands, 1853, but was brought up at Madrid. His *Clave de la Perfección*, 1876, and *El Comendador*, 1877, have been translated into English, and entitle him to be classed among the most noted modern writers.

**Galen (gai'len)**, or Claudius Galenus, celebrated Greek physician, was born at Pergamus, in Mysia, 120 A. D. He first studied at his native city, and afterward at Smyrna, Corinth, and Alexandria. In his thirty-fourth year he went to Rome, where he stayed for about a year, and then returned with a reputation that he was offered, but declined, the post of physician to the emperor. The place and time of his death are uncertain, though the latter is believed to have been 201.

**Galilei, Galileo (gai'li-ai)**, celebrated Italian astronomer and physicist, born at Pisa, 1564. While a student he had constructed the nature of vibrations or swings of a pendulum—i. e., its isochronism. In 1588 he was provided with a lectureship at Pisa University. At this period he constructed the first accurate balance. Owing to veiled suspicion and hostility and the loss of court favor, he quitted Pisa, and obtained the professorship of mathematics in Padua University in 1592. In 1609 he constructed the telescope on the model of that of Hans Lippershey of Middelburg, Holland, and with it discovered four satellites of Jupiter, as well as the fact that they were not stars, but planets actually revolved around the bright planet. The uneven configuration of the surface of the moon was demonstrated; and he detected sun-spots. The astronomer was invited to Florence, in 1610, by his patron, Cosimo, Grand Duke of Tuscany, and established as his philosopher and mathematician. Continued advocacy of Copernican principles, and their Scriptural significance, brought him under the ban of the church.

In 1632 appeared his *Dialogues on the Systems of the World*, after which he was peremptorily summoned to Rome by Pope Urban VIII. Stricken in years, and dread-ing imprisonment, Galileo publicly abjured his own philosophy. Accused of heresy, he was, among other penalties, to suffer detention, while he recanted his statements. At the close of 1633 he was permitted to return to Arcetri, Florence, where he thereafter lived in seclusion. An edition of Galileo's works, with correspondence, including what is perhaps his most important production, *Dialogues of the New Sciences*, was undertaken by the Italian government in 1890. Died in 1642.

**References.**—*Galileo*, by Viviani; T. Henri Martin; Favaro; and Fahr. Also Lodge's *Portraits of Science: Shelley's Literary and Scientific Men of Italy*; Bell.

**Gail (gai; Gar, gail)**, Franz Joseph, German physician, founder of phrenology, was born at Tiefenbrunn, on the border of the Tyrol, 1758. In 1785 he established himself as a physician in Vienna, where for many years he carried on a series of elaborate investigations of the nature of the brain and its relation to the outer cranium. Died 1823.

**Gallait (gai'ait)**, Louis, Belgian historical painter, was born at Tourney, 1810, became famous by pictures on subjects from the history of the low countries. He died in 1880.

**Galland (gai'land)**, Antoine, French orientalist, was born at Rodos in Icarus, 1646. Attached in 1670 to the French consulate at Constantinople, he traveled in Syria and the Levant, 1673-79.

In 1709 he became Arabic professor in the Collège de France. He is best known by his translation of the Arabian Nights. Died 1715.

**Gallatin (gai'd-ni)**, Albert, American financier and statesman, was born at New York, 1781. He graduated there in 1779 came to the United States in 1789, taught French at Harvard, became an editor of the *North American*, and entered political life in 1789. In 1795 he entered Congress from Pennsylvania, and in 1801-14 was secretary of the treasury, and the first president of the American Philosophical Society, his writing to historical and ethnological researches, his time on finance, politics, and the Indian tribes. He was one of the founders of the first president of the ethnological society of America. Died 1849.

**Gallaudet, Thomas Hopkins**, educator, philanthropist, was born in Philadelphia, Pa., 1787. He was graduated at Yale college, 1805; taught in 1810; founded and became superintendent of the American asylum for deaf mutes at Hartford, Conn., 1815.

**Galle (gai'li)**, Johann Gottfried, German astronomer, was born in Prussian Saxony in 1812. He studied at Berlin, 1830-33, became director of the Berlin observatory, and shared with Leverrier the honor of discovering the planet Neptune. He afterward became professor of astronomy at Breslau. Died in 1910.

**Gallinger, Jacob Harold**, physician, United States senator from New Hampshire, was born at Wall, N. H., 1837. He received an academic education, graduated in medicine, 1858, and practiced for several years. He was elected to Congress, 1858-59. Elected to United States senate, 1891, and reelected 1897, 1903, and 1909.

**Gallie (gai'lee)**, Alexander, English statesman, was born at Chelsea, England, 1817, and emigrated to Canada when a boy. From 1840 to 1850 he was secretary of the first president of the Dominion. After 1857 he allied himself with the liberal-conservative party, and was elected one of the lords of the council in 1861. He was the author of *Canada from 1549 to 1869*. Died 1893.

**Galt, Sir Thomas**, Canadian jurist, brother of the former, was born in England in 1815, and educated in Scotland. He removed to Canada in 1842, and was admitted to the bar in 1845. He was elected to the legislature of Ontario, and of the common pleas, and in 1857 chief justice of the court of common pleas. He was knighted in 1861. Died 1901.

**Galtion (gai'ton)**, Francis, English scientist and traveler, was born near Birmingham, England, 1810. He was educated at King Edward's school, Birmingham, and King's College, London, studied medicine, and graduated at Trinity College, Dublin, 1834; D.C.L., Oxford; Sc.D., Cambridge. He has been an officer and member of many scientific societies. For his *Journal of his Expedition to Tropical South Africa* received the gold medal of the Royal Geographical society.

**Galyant (gai'ant)**, Lelio, Italian physician and physicist from whom "galvanism" derived its name, was born in Bologna, 1737. He made those discoveries, partly by means of experiments on the muscles of frogs, which he published to the world in 1791 in his treatise entitled *De Viribus Electricitatis in Motu Musculari Communi*. The now fully-established doctrine of animal electricity owes its origin to the patient and laborious investigations of the Bologna professor. Died 1798.

**Gama (gai'ma)**, Vasco da, Portuguese navigator, was born about 1469. He was a merchant, and early distinguished himself as an intrepid mariner and was selected by King Emanuel to discover the route to India around the cape of Good Hope, the cape, despite hurricanes and mutinies he made Melinda early in the following year. For twenty years he commanded the Portuguese fleet, while the extended Portuguese conquests were presided over by five viceroys. The fifth was so unfortunate that John III. in 1524 despatched Da Gama to India, where he succeeded in making Portugal more respected, but soon after his arrival he died at Cochim, 1524.

**Gammaliel (gai'ma-li-ai)**, St. Paul's teacher, was a prominent Pharise, and taught "the law" early in the first century. He was crucified in 1870. It seems to have placed Christianity on a par with other sects; and he claims to have long-suffering on his part.

**Gambetta (gai'm-be-ta)**, Léon Michel, French lawyer, statesman, and orator, was born at Cahors, France, 1832. He studied law at Paris, and came to Paris bar. It was not until 1868 that his name came prominently before the public. When the first revolutionary war broke out in 1870, Gambetta sought by deeds to give it an exclusively republican character. The decree was issued by the legislative body, and Gambetta resigned office as minister. He subsequently entered the assembly as a member for the first time in 1881, but in 1881, for a few months resigned. Died 1882.

**Gannett (gai'net)**, Henry, geographer and statistician, was born at New York, N. Y., 1825. He was born at Beth Me, 1846. He was

graduated from Lawrence scientific school, Harvard University, L.L.D., Howard university, director census of Cuba, 1907-08. Author: *Statistical Atlas of Algeria*; *Commerce*; *Statistics of the United States*.

**Garcia (gar'd-ai)**, Manuel, musical genius, was born at Seville, Spain, 1778. After acquiring a European reputation in Seville, he came to Madrid, he went to Paris in 1808, where he obtained great success at the Italian opera; and in 1811 he came to London, where he was received with equal favor in Turin, Rome and Naples. Died at Paris, 1817.

**Garcilaso (gai'ar-d-ai)**, *Don* *Alonso* *de la Vega* (gai'ar-d-ai *de la Vega*), Spanish soldier and poet, was born at Toledo about 1500. He wrote a number of sonnets and other poems, and was called the "Spanish Petrarch." Died at Nice, 1536. **Garcilaso (gai'ar-d-ai)**, *Don* *Alonso* *de la Vega* (gai'ar-d-ai *de la Vega*), Peruvian historian, known as "the Inca," was born at Cuzco, in Peru, about 1540. At the age of twenty he proceeded to Spain, and never again visited America. His first work was a *History of Florida*, containing an account of the conquest of the country by Hernando de Soto. Died 1616.

**Gardener, Helen Hamilton**, author, was born at Winchester, Va., 1858. She was graduated at Cincinnati high and normal schools; married Col. S. A. Day, United States army, of 1901. She has done much magazine work as editor and contributor, and has written many stories, essays and scientific articles.

**Gardiner, Samuel Rawson**, English historian, was born at London, 1827. He was educated at Christ Church, Oxford. In 1854 he was elected fellow of All Souls; and was for many years professor of history at Oxford, and he was made a baronet. His historical works include *England Under the Duke of Buckingham and Charles I.* *The Persecution of the Catholics in the reign of James II.* *The Monarchy of Charles I.* Died 1902.

**Garfield, Harry Augustus**, educator, was born at Hiram, Ohio, 1831. He was educated at Williams College, 1850; studied law at Columbia Law School one year, and at Andover, Mass., and he was elected president of Williams College, 1860, and assumed duties in June, 1860.

**Garfield, James Rudolph**, lawyer, former secretary of the interior, and son of James Abram Garfield, was born in Orange, Cayuga county, Ohio, 1831. He entered Williams College, 1849, and graduated in 1853. He studied and practiced law, and was a member of the Ohio senate, 1859-60; entered the army in 1861, and was promoted to the rank of lieutenant in southeastern Kentucky, and was promoted to be brigadier-general of volunteers, 1862; promoted major-general of volunteers, 1863. He was assigned to occupy a seat in the thirty-eighth congress; elected United States senator in the spring of 1865, and was sworn in as senator in the close of 1865, and entered upon office in the spring of the following year; but on the 2d of July he was shot by the assassin Guiteau, while at the Washington station of the Baltimore and Potomac railway, and died at Elberon, N. J., after lingering for nearly three months. His untimely death was mourned, not only by his own countrymen, but by the whole civilized world. Died 1881.

**Garfield, James Rudolph**, lawyer, former secretary of the interior, and son of James Abram Garfield, was born in Hiram, Ohio, 1865. He was graduated at Williams College, 1883, studied at Columbia Law School; was admitted to the bar in 1885; practiced law in Ohio, 1886-1890; was member Ohio senate, 1886 to 1890; was secretary of the interior, 1907-09.

**Garibaldi (gai'ar-d-ai)**, Giuseppe, Italian patriot, was born at Trapani, Sicily, 1807. He was himself enthusiastically with Mazzini for the liberation of his country. He took part in the defense of the city of Palermo, 1848, and was elected, led to New York, to return to the island of Capri, biding his time. He joined the Piedmontese against Austria, and in 1860 set himself to assist in the overthrow of the kingdom of Naples and the union of Italy under Victor Emmanuel. Landing in Calabria, he defeated the king and drove the royal forces before him, after which he returned to his retreat at Capri. In 1870-71 he commanded the French force in the Franco-German war. Died 1882.

**Garland, Hamlin**, American novelist and short-story writer, was born at Scotch-Irish descent, Salem, Wis., 1860. Since 1890 he has devoted himself to lecturing and writing. Besides a collection of short stories, he has written and published the following books: *Rosie of Dutcher's Cove*; *A Little Rover*; *Jason Edwards*; *A Member of the House*; *The Frenchman*; *The Frenchman's War*; *Dr. Hester*; *The Tramping of the Dark*; *The Shadow World*, etc.

**Garnier (gai'ner)**, Louis Charles, French architect, was born at Paris, France, 1825. He studied at the school of fine arts, and began to exhibit in 1845, and after coming to Paris, he traveled in Italy and Greece. In 1854 he set up as an architect in Paris, and in 1861 completed for the first time the new opera house in Paris. Died 1898.



**George I.**, king of Greece, was born at Copenhagen, 1845. He is a brother of the dowager empress of Russia, Queen Alexandra, and King Frederick of Denmark.

**George, saint**, the patron saint of England. His life history is not known. He is believed to be the saint George who was a soldier in the army of Diocletian, 303 A. D., and that he suffered death for the Christian faith in 303. His name was made home his fame from the East, and Edward III. made him patron of his new order of the garter.

**Gerard** (*ger'ard*), **Kilian**, German, distinguished marshal of France, was born in Lorraine, 1773. He especially distinguished himself at Austerlitz, Jena, Eylau, Friedland, and Borodino. He died the morning after this last battle he received the title of baron of the empire. In 1833 he was made grand-chancellor of the empire. He died in 1852.

**Gérard, François Pascal, Baron**, French painter, was born in Rome, 1770. Nearly the whole of his life was spent in Paris. His famous portraits were those of Napoleon, Talleyrand, Lamour, and Blücher. He died in Paris, 1837.

**Gerhardt** (*ger'hart*), **Karl Friedrich**, German chemist, was born at Strassburg in 1816. At the time of his death he was professor of chemistry in the University of Strassburg. Gerhardt and Laurent were the joint authors of the system of chemical notation now in use. All his suggestions and discoveries are embodied in his *Traité de Chimie Organique*. Died, 1856.

**Gerhardt, Paul**, Lutheran hymn-writer, was born at Grifflinghausen in Saxony, 1791. He was a assistant pastor at St. Nicholas in Berlin in 1857, but for opposing the elector's attempted union of the Lutheran and Reformed churches was banished in 1866. Died, 1876.

**Germanicus, Caesar** (*jer-man'-i-kus*), son of Nero Claudius Drusus and Antonia, daughter of Augustus. Mark Antony and niece of Augustus. In 12 A. D. he was consul, in 13 was appointed to the command of the eight legions on the Rhine, and in 14 quater a great victory. Died, 19 A. D.

**Gérôme** (*jer-om*), **Jean Léon**, distinguished French painter, was born at Paris, 1824. After studying at Paris and traveling in the East he was appointed professor of painting in the school of the Louvre at Paris. Among the best known of his works are *Phryne before Her Judges*; *Cleopatra and Caesar*. Died, 1904.

**Gerry, Elbridge**, American statesman, fifth vice-president of the United States, was born in Massachusetts, Mass., 1744. He graduated at Harvard College, 1762. In 1776 he was elected a delegate to the continental congress, signed the declaration of independence, and was one of the most important committees. He was a member of congress, 1789-93, and in 1797-98 special agent to France. He died, 1846.

**Gerson** (*jer'son*), **Charles de**, French theologian, was born at Gerson, in the diocese of Rheims 1263. He became chancellor of the University of Paris, 1298, and from that time was active in church unity and ecclesiastical reform. Died at Paris, 1298.

**Gervais** (*jer'veis*), **Honoré Hippolyte Achille**, member of Canadian house of commons for city of Montreal since 1904, was born at Richelieu, Quebec, 1864. Promoter of technical education at Montreal and Quebec and high school of agriculture at Oklahoma; administrator of Laval University; corresponding member of the Académie de législation comparée de France; member of council of Montreal bar; bâtonnier of the bar of Montreal, 1908; bâtonnier of the bar of the province of Quebec, 1908.

**Gervinus** (*jer-vee'nus*), **Georg Gottfried**, German critic and publicist, was born at Darmstadt, 1805. He became in 1836 professor of history at Göttingen. In 1844 he was appointed honorary professor in Heidelberg, and from that time worked in the field of constitutional liberty. His great commentaries on Shakespeare were translated into English in 1892. He died in 1871.

**Gezausius** (*jer-ge'us*), **Friedrich Heinrich Wilhelm**, German Hebraist and oriental scholar, was born at Nordhausen, 1806. He became professor of theology at Halle in 1841. His greatest work is his *Hebrew and Chaldean Lexicon* left unfinished at his death. He died in 1876.

**Gessner** (*jer'sner*), **Salomon**, German pastoral poet, who also painted and engraved landscapes, was born at Zürich, 1733, where he was a book-seller. His landscape-paintings are all in the conventional classic style, but his engravings are of real merit.

**Grevier** (*jer'vair*), **August Friedrich**, German church historian, was born at Würzburg, 1803. In 1830 he became librarian at Stuttgart. In 1846 he became professor of history at Freiburg. Died at Freiburg, 1864.

**Ghiberti** (*jer-bee'ti*), **Lorenzo**, Italian sculptor, was born in Florence about 1378. He was the sculptor of the bronze doors of the cathedral of Santa Giovanni, Florence. He died in Florence in 1455.

**Ghika** (*jer'ka*), **Helena**, or "Dora d'Istrie," daughter of Prince Michael Ghika, was born at Constantinople, 1828. Her works include *La Vie Méroïenne dans l'Égypte Orientale*; *La Suisse Allemande Les Deux*; *Druse Mendée*. Died, 1888.

**Ghibellinajo** (*jer'lan-da'y-jo*), otherwise called **Corradino**, or **Sigifredo**, **Domenico** died, Florentine painter, was born in 1445. He was active in the decoration of the Sistine chapel in Rome, and executed a series of frescoes in the Sassetti chapel in the church of Santa Maria Novella.

**Gibbon, Edward**, celebrated English historian, was born at Putney in 1737. He was sent to Magdalen College, Oxford, where he became a convert to the Roman Catholic Church, and finally a Jesuit. He was a man of great talents, and a man of great energy, but he renounced the Catholic faith, without embracing any other, and became a skeptic.

On returning to England, he entered upon the duties of active life, but read much, and prepared himself for authorship. In 1763 he went to Italy; and while sitting amidst the ruins of the Capitol at Rome, he conceived the idea of writing the history of the decline and fall of that city. In the meantime, he joined M. Deyverdun, a Swiss scholar, in publishing a journal called *Mémoires Littéraires de la Grand Bretagne*, which met with no success.

In 1770 he began his celebrated history of the Decline and Fall of the Roman Empire, the first volume of which appeared in 1776, the second and third in 1781, and the three remaining volumes in 1788. In 1763 he undertook, Gibbon was chosen member of Parliament for Liskeard; and when hostilities commenced between England and France, in 1778, he was employed to draw up the manifesto on that occasion, after which he was made commissioner of the board of trade, but lost his place on the change of administration in 1783. He then went to Geneva, where, in 1784, he met the French Revolution obliged him to return to England; and died in 1794.

Gibbon's great history abounds with proofs of immense learning, of a penetrating and sagacious, and of almost unrivaled talents for ridicule. No other proof of the substantial trustworthiness of the Decline and Fall is needed than the fact, perhaps unargued, that this history has been a great advance made in historical studies and criticism during the present century, it still holds its place as preeminently the history of the period it embraces.

**Gibbon, John**, *William's Life and Correspondence of Gibbon*, the *Mémoires*, ed. by Emerson, and Morison's Gibbon in English Men of Letters Series.

**Gibbons, Grinling**, English sculptor and wood-carver, was born at Rotterdam, 1648. Died in London, 1735.

**Gibbons, James**, Roman Catholic cardinal, was born in Baltimore, Md., 1834. Entered St. Charles College, Maryland, 1853; transferred, 1857, to St. Mary's Seminary, Baltimore; ordained priest, 1861; later private secretary to Archbishop Spalding and chancellor of the arch-diocese; assistant chancellor, second plenary council of American Catholic church, Baltimore, 1866; vicar apostolic of North Carolina; odd-jut archbishop of Baltimore, 1877; succeeded to the see, 1877; was nominated as cardinal; invested with the princely insignia, 1888.

**Gibbs, Oliver Wolcott**, American chemist, was born in New York city, 1822; was graduated at Columbia, 1844; studied in Germany at Berlin. In 1849 he was chosen professor of physics and chemistry in the College of the City of New York. Died, 1895.

**Gibson, Charles Dana**, illustrator, was born in Roxbury, Mass., 1867. He was educated at Fitchburg, Mass., and at the art students' league, New York, 1884-85. He has done much illustrating in principal magazines; also illustrated Quaker's book, 1890; brother of law society of upper Canada, 1890; president of Dominion portrait and trading company.

**Gibson, William Hamilton**, American painter and sculptor, was born at Sandy Hook, Conn., 1850. He was a student of the art students' league, the Brooklyn Polytechnic Institute. He was early attracted to the study of flowers and insects, and his work in drawing was of these natural objects. Died, 1906.

**Giddings, Franklin Henry**, sociological writer, professor of sociology, was born at New York, born at Sherman, Conn., 1855. He graduated at Union College, 1877; Ph.D., L.L.D.; professor of sociology at Union College, 1889-94. Member of Authors' and Century clubs.

**Giddings, Joshua Reed**, American statesman, was born in Athens, Pa., 1795. He removed with his parents to Ohio, where he was born in 1820, and selected to the Ohio legislature in 1826. He sat in congress, 1838-59, and was an anti-slavery advocate.

**Giers** (*jer's*), **Nikolai Karlovich**, de Russian diplomat and statesman, was born in Russia, of Swedish origin, in 1814. He was graduated at the University at eighteen years of age. In 1876, and again in 1877, during the war with Turkey, M. de Giers directed the Russian diplomatic mission in Constantinople, and when Prince Gortchakoff attended the Berlin congress M. de Giers was his interpreter.

**Gieseler** (*jer'se-ler*), **Friedrich Wilhelm Benjamin von**, German historian, was born in Berlin, 1814. He was graduated at the University at Königsberg in 1837, and in 1862 at Munich.

**Gieseler** (*jer'se-ler*), **Johann Karl Ludwig**, German church historian, was born near Minden, 1792. In 1813 served in the war against France. On the conclusion of the war he held educational appointments at Minden; was nominated in 1819 to the chair of theology at Bonn, and in 1831 was appointed to a like professorship in Göttingen. Died, 1864.

**Gifford, Robert Swain**, American painter, was born in Massachusetts, 1840. He studied painting under Albert van Beest, and opened a studio in New York city, 1864. He was elected a member in New York city, and became an academicien in 1878. Died in New York, 1905.

**Gifford, Robert**, American sociological painter, was born in Greenfield, N. Y., 1823. In 1854 he became a member of the National Academy, New York city.

**Gifford, William**, English critic and poet, was born at Ashburton, 1795. Gifford's editorship of the *Anti-Slavery* procured him favor with the Tory magnates, but disappointed to offices that brought him 900 pounds a year. He died in 1826.

**Gilbert, Grove Karl**, geologist, was born in Rochester, N. Y., 1815. He was graduated at the University of Rochester, 1832; L.L.D. United States geological survey, since 1879. Past president of American association for the advancement of science. Author: *Geology of the Henry Mountains*.

**Gilbert, William Schwenck**, English dramatist, was born in London, 1836. In conjunction with Sir Arthur Sullivan, besides *Tasmani* and *Trial by Jury*, he wrote *The Pirates of Penzance*, *The Mikado*, *Ruddiger*; *The Yeoman of the Guard*; *The Gondoliers*.

**Gilbert, William**, English journalist, critic, was born at Flushing, N. Y., 1849. With brother, Joseph B. Gilchrist, started, 1881, *The Critic*, which the next year was merged in *The Nation*. His pen-name "Brunswick." New York correspondent for *Boston Saturday Evening Gazette* and *Boston Herald*. Since 1890 regular correspondent of *Chicago Tribune*.

**Gilder, Richard Watson**, author, editor, was born in Boston, 1842. He was graduated at Harvard, 1864. He was editor of *The Nation*, 1864. His father's name at Flushing, L.I.; L.L.D., A.M. L.H.D., Yale, L.L.D.; managing editor of *Scribner's Monthly*, 1870; editor-in-chief, 1881, under its present name *The Century Magazine*. President of public art league of United States; member of council of national civil service reform league. Author: *Isaiah*; *The Celestial Passion*; *Lyrics*; *Isaiah*. Died, 1909.

**Gildersleeve**, **Rail Lammear**, professor of Greek in Johns Hopkins since 1876, was born in Charleston, S. C., 1831. He was graduated from Princeton, 1849; Ph.D., L.L.D., 1860; Harvard, 1890. D. C. L., L.H.D. Editor of *American Journal of Philology* since it was founded, 1880. Author: *Latin Grammar*.

**Gill, Theodore Nicholas**, zoologist, educator, was born in New York, 1837. Assistant librarian, Smithsonian Institution, 1860-61. Columbia University. Adjunct professor of physics and natural history, 1860-61; head department of zoology, 1861-62. George Washington University. President of American association for the advancement of science, 1897. Author: *Principles of Zoology*; *Science and Popular Views of Nature*; *Contrasts*, etc.

**Gillette**, **Charles**, actor, playwright, was born at Hartford, Conn., 1856. Began theatrical work, 1877. Author of the following plays (unpublished): *The Professor*; *The French Society*; *Hold by the Enemy*; *Because She Loves Him* *Boy*; *Settled Out of Court*; *Secret Service*, and *Sherlock Holmes*.

**Gilray, James**, English caricaturist, was born, a Lamerstocker's son, at Chelsea in 1757. He painted and engraved caricatures.

**Gilman, Daniel Colt**, educator, was born in Norwich, Conn., 1831. He was graduated at Yale, 1852; studied in Germany, and was professor of geography, Yale, 1856-72; president of University of California, 1873-75; first president of Johns Hopkins University, 1876-77; president of Carnegie Institution, 1901-04; editor-in-chief, *New International Encyclopedia*. Died, 1908.

**Gilman, William Brewster**, American naturalist, zoologist and ethics of Maryland Theological Seminary since 1898, was born at Quincy, Ill., 1849. He graduated at the University of Chicago, 1871. Settled as Unitarian clergyman for three parishes,









tion of his long and valuable services in the Dominion of Canada." In 1855 he founded the

**Graaf (graaf), Regnier de.** Dutch physician and anatomist, was born in Schoonhoven, 1641. He was specially distinguished by his discovery that all animals are oviparous. The Graafian vesicles were discovered by him some time after him, though he mistook their functions. He rendered great service to anatomy through his use of the injections into the blood-vessels which Swammerdam and Knyen afterward brought to a state of comparative excellence. Died at Delft, 1673.

**Græchus** (*grak'us*), name of a distinguished Roman family, to which belonged the two celebrated tribunes, Tiberius Sempronius Græchus (163-133 B. C.) and Caius Sempronius Græchus (159-121 B. C.). The former was tribune of the plebs 133 B. C., and the latter 123-122 B. C. They were both the sons of Tiberius Sempronius Græchus (who had been tribune of the plebs in 184 B. C.) and Cornelia, the daughter of the famous Scipio Africanus the elder. Both the brothers fell victims to their zeal in attempting to contend with the growing corruptions of the Roman state.

**Grady, Henry Woodfin**, journalist, orator, was born at Athens, Ga., 1851. He was educated at the state university at Athens, and took a post-graduate course at the University of Virginia. He became editor of the *Rome, Ga., Daily Constitution* and edited the *Atlanta Constitution* from 1886 to 1890 and in 1890 became part owner and managing editor of the *Atlanta Constitution*, which he conducted until his death. He was an eloquent speaker, a man of broad and liberal views; and, during his brief public life, did as much as any one man could to secure the rights of the colored people in the South. Died Atlanta, Ga., 1899.

**Grand, Sarah**, assumed name of Frances Eliza,

Clarke, British novelist, was born in Ireland, of English parents; daughter of Edward John Bellen-den Clarke, lieutenant royal navy. She married at sixteen, brigade-surgeon Lieutenant-Colonel McFall, who died in 1898. She traveled for five years in the East, China, and Japan; wrote *Ideals* at twenty-six, and has since interested herself in the woman's movement. She is vice president of the Central and Western society for woman's suffrage, vice-president of the Scottish association for the promotion of women's public work, vice-president of Garden City association, etc.

**Grand, Frederick Dent**, United States army officer, was born at St. Louis, Mo., 1850, son of President U. Simpson Grand. He was graduated from the United States military academy, 1871, commissioned second lieutenant 4th cavalry, 1871, and served on the frontier, 1873-81. Appointed United States minister to Austria by President Harrison, 1883; police commissioner, New York, 1894-98; military governor, United States army, 1906. Served in Puerto Rico one year, and after war commanded military district of San Juan; in Philippine islands, 1899-1902; commanded department of Texas, 1902-04, department of the Lakes, 1904-06, and department of the East, 1904-08.

**Grant, James**, British military novelist, was born in Edinburgh, 1822. Having contributed copiously to the *United Service Magazine* and the *Dublin University Magazine*, he published in 1846 his *Romance of War*, the first of a long series of novels and histories, illustrative mainly of the achievements of Scottish arms abroad. He died in London, 1887.

**Grant, Robert**, author, judge probate court and court of insolvency for Suffolk county, Mass., since 1893, was born at Boston, 1852. He was graduated at Harvard College, 1875; Ph. D., 1876; Harvard Law School, 1879; was water commissioner, Boston, 1888-93. Author: *The Confessions of a Providence Art*; *Confessions of a Heretic* (verse); *The Lawless* (verse); *Yankee Doodle* (verse); *The Oldest School in America* (verse); *An Average Man*; *The Art of Giving*; *Search-Light Letters*; *Unlearned Bred*; *The Undercurrent*; *The Orchid*; *The Law-Breakers*, etc. He has been an overseer of Harvard College since

1840.  
**Grant (Hiram) Ulysses Simpson**, eighteenth president of the United States, was born at Point Pleasant, Clermont county, Ohio, 1822; graduated at the military academy of West Point in 1843; served in the Mexican war, and was in the war with Mexico, 1846, up to the capture of Monterey. In 1852 he served in Oregon; but in 1854 resigned his commission and acted as a private soldier in the 69th New York regiment, and was promoted to captain in 1859, moved to Galena, Ill., and engaged in the leather trade. At the beginning of the civil war in 1861, he volunteered as a private in the 21st Illinois regiment, and was promoted to major in 1862. In August he was appointed brigadier-general, commanding the important post of Cairo, occupied Paducah, and led an expedition to Fort Donelson. In February, 1862, he distinguished himself in the capture of Fort Donelson, on the Tennessee river, and

and the opening of the Mississippi. He then in 1864, was appointed lieutenant-general and commander-in-chief, and personally directed the operations of the army in the West, in which the northern forces, though often repulsed with heavy losses, finally compelled the evacuation of the rebel forces from the Mississippi valley by the surrender of the confederate army under General Lee, and soon after of the entire confederate army. In 1865, he was appointed lieutenant-general, passed an act reviving the grade of "general of the army of the United States," and in 1866, he was elected to the office of major-general. In 1868 he was elected, on the republican platform, president of the United States; and having in 1869, been elected to the office of lieutenant-general, Horace Greeley of the *New York Tribune*, he retired in 1877 after his second term of office. In 1878, he was elected to the office of major-general of the world. In England and France he received an enthusiastic welcome. Simple, reticent, earnest, and unassuming, he was a man of great military success not so much to strategy as to superior numbers and resources, and having fighting qualities, he was not a man who could be easily able to resist. Having lost his moderate fortune in an unfortunate speculation, Grant was not a man who could be easily able to resist, to some extent relieved him. He died of

**Gratianus** (grá'ti-á'nú), **Augustus**, Roman emperor from 373, was born in Sirmium, Pannonia, 359. Gratianus was pious, temperate, amiable, eloquent; but his fondness for frivolous amusements and his persecution of pagans and heretics alienated his subjects; so that when Maximus was proclaimed emperor crowds flocked to his standard. Gratianus was defeated by him near Paris, and fled to Lyons, where he was put to death, 383.

**Britton** (*grá'm*), **Henry**, Irish orator and statesman, was born in Dublin in 1746. He was educated at Trinity College, Dublin; in 1772 was admitted to the Irish bar, and in 1775 was returned to the Irish parliament. Mainly to him was owing, among other things, the partial abolition of the heavy restrictions on Irish commerce. As an orator he stands in the first rank. His style is full of point, rapidity, antithesis, and poetic suggestiveness. His eulogy on Chatham and his invective against Bonaparte are not surpassed in British eloquence. Died, 1820.

**Traves, John Temple**, journalist and orator, was born at Willington Church, Abbeville county, S. C., 1825; was editor of *Daily Florida Union*, Jacksonville, 1881-83; *Atlanta (Ga.) Daily Journal*, 1887-88; *Tribune of Rome (Ga.)*, 1888-90; editor-in-chief and co-proprietor of *The Daily News*, New York, 1890-91; editor of *New York American* since 1907. Presidential election at-large, Florida, 1884; was colonial on staff of Governor Northern of Georgia. Author: *History of Florida of To-Day*, *Twelve Standard Men of Florida*, *Florida's Representative Institutions for Schools*; *The Negro*. Contributor to various American periodicals as advocate of

separation of black and white races, etc.

**Gray, Asa.** American botanist, was born at Paris, N. Y., 1810. He was graduated in medicine at Fairfield College, and in 1843 received the appointment of botanist of the United States exploring expedition. He was afterward appointed professor of botany in the university of Michigan; but before he had entered upon the duties of that office he was elected, in 1842, Fisher professor of natural history at Harvard University. In addition to his lectures at Cambridge he delivered some lectures at the Lowell Institute in Boston. He was married in 1841, and had three children.

In Boston. He ranked among the leading botanists, not only of America, but of the age. He wrote: *Elements of Botany; Flora of North America; How Plants Grow; Field, Forest and Garden Botany; Darwiniana; Synoptical Flora of North America; Natural Science and Religion*, etc. Died, 1888.

**Gray, George**, jurist, was born at New Castle, Del., 1840. He was graduated at Princeton, 1860; LL. D., 1889. Studied law at Harvard, and was admitted to the bar, 1863; attorney-general of Delaware, 1879-85; United States Senator, 1883-99; member of peace commission, Paris, 1898; appointed by the President a member of the joint high commission to Queen Liliuokalani, 1898; member of the international permanent court of arbitration under The Hague convention, 1900; judge of United States Circuit Court, third judicial circuit, since 1899; chairman of anthracite coal strike commission, 1902.

**Gray, Horace** American jurist, was born at Boston, 1825; was graduated at Harvard, 1845, and its law school, 1849; was admitted to the bar, 1851; Associate-justice of the Massachusetts supreme court, 1864-73, and chief-justice, 1873-81, when he was appointed successor to Judge Clifford in the United States supreme court. He remained a member of this tribunal until shortly before his death, 1902.

**Gray, John Chipman**, lawyer, educator, was born at Brighton, Mass., 1839; graduated at Harvard, 1859; LL. B., 1862; LL. D., Yale and Harvard. Admitted to bar, 1862, but in same year entered army and served, 1862-65, from Lieutenant to major and judge-advocate of United States

volunteers. Since the war he has continuously engaged in the practice of law in Boston. Lectured at Harvard Law School, 1869-71; Story professor of law, 1875-83, and Royal professor of law since 1883, in same school. Author: *Restraints on Alienation; The Rule Against Perpetuities; Select Cases and Other Authorities on the Law of Property* (6 vols.), etc. Died 1909.

**Jay, Thomas**, English poet, was born in London, 1716. He was educated at Cambridge, and appointed professor of history and modern languages there in 1769. He had a just appreciation of the natural beauty of his native country, made notes wherever he went, and wrote copious descriptions of what he had seen to his literary friends. He published his *Ode to Eton College* in 1747, and his *Ways Written in a Country Churchyard*, by which he is best known, several years later. On the death of Cory Gibber he was offered, but declined, the post of poet laureate. Died, 1771.

**Reely, Horace**, American journalist, was born at Amherst, N. H., 1811. He started a printing office as an apprentice at East Prudence, Vt., in 1828, and in 1830 he came to New York, where he worked for some time as a journeyman printer, and in 1834 founded the *New Yorker*, a literary and political journal, which he edited for years, and other articles. After one or two other attempts at editorship he founded, in 1841, the *New York Tribune*, and became the leading journalist of the country. He was one of the earnest advocates of temperance, woman's rights, the abolition of slavery and capital punishment, and of the rights of the colored race. He was the organ of the extreme or radical party. His aspirations to political position were defeated by the conservative party leaders, and he, in turn, issued the *Journal of Liberty* in New York, Ireland, in 1860. On the secession of several of the southern states from the Union, he was one of the first to declare his opposition, in accordance with the principles of the declaration of independence; but, when the war began, he became a supporter of the Union, and was one of those who caused the premature advance that resulted in the defeat at Bull Run, 1861. In 1873 he was an unsuccessful candidate for the

**Grady, Adolphus Washington**, American general, was born at Newburyport, Mass., 1844. Entering the volunteer service, he attained the rank of captain during the civil war, and at its close was transferred to the regular army with the rank of major. He was assigned to the 1st Cavalry, the signal service, and in 1881 was assigned to the command of the Lady Franklin bay expedition to northern Greenland. After suffering extreme and terrible hardships, Grady, a few days before his death, was rescued by a relief party. He was the father of his country in 1884, by an expedition sent to his relief from the United States Government. He published an account of the expedition in 1886, under the title of *Arctic Expeditions*. In 1890 he became chief of the United States signal service, and was head of the weather bureau from that time until it passed under control of the department of agriculture. He was made major-general in 1898.

**Green, Betty Howland Robinson,** American financier, was born in New Bedford, Mass., 1835, daughter of Edward Mott Robinson, who died in 1865, leaving her a large fortune. She is said to be the richest woman in America, and probably the greatest women financier in the world. She personally manages her large property in stocks, bonds, and real estate in Chicago, New York, and elsewhere.

and elsewhere.

**Green, John Richard**, English historian, an born at Oxford, England, 1837, and educated at Magdalen College, Oxford, and Jesus College, Cambridge. He took orders in 1860, and was for some time vicar of St. Philip's, Stepping, becoming in 1868 Librarian at Lambeth. Author: *A Short History of the English People; A History of the English People; The Making of England, and The Conquest of England*. The latter was published after his death by his wife, who assisted him in various works, and herself wrote *Henry II.* in the Twelve English Statesmen series. Died, 1883.

**Green, Thomas Hill**, English philosopher, was born in Yorkshire, 1836. Educated at Rugby and Balliol College, Oxford, 1859, he in 1860 was appointed to a lectureship in metaphysics at Oxford, and in 1877 Whyte professor of moral philosophy, and died in 1882. Green a noble character, contagious enthusiasm, philosophical profundity, and strong interest in moral questions, were the chief features of his life and work. His *Prolegomena to Ethics*, left incomplete at his death, was edited by A. C. Bradley, and two "lay-sermons" by Arnold Thynne in the same year. His sentences are in vogue. See *Green*, by R. L. Nettleship.

**Green, William Henry**, American Presbyterian theologian, was born at Groveville, N. J., 1825. He was graduated from Lafayette College, 1840, and at Princeton theological seminary, 1846. In 1851 he was made professor of biblical and oriental literature at Princeton, and was chairman of the committee which revised the old



of ethics and education Leland Stanford Jr. University; public lecturer since 1899. Author: *The New Humanism*; *Principles of Education*; *Moral Education*; *Human Equipment*, etc.

**Griggs, John William**, lawyer, United States attorney-general, 1871, was born at New York, N. Y., 1848. He was educated at Lafayette College, 1868; admitted to the bar, 1871; practiced at Paterson; member of the New Jersey bar, 1874; admitted, 1877; became attorney-general, 1882-88; president of New Jersey senate, 1886; governor of New Jersey from January, 1890, until re-elected, January, 1896. He was chief of attorney-general in President McKinley's cabinet; member of Hague conference of arbitrators. **Grillparzer (Grillparzer), Franz**, Austrian dramatist poet, was born at Vienna, 1791. He was educated, jurisprudence, 1818; entered the imperial civil service, in which he remained until 1856. He first attracted notice in 1817 by a tragedy, *Der Ahnfrau*, which followed by *Sappho*, *Das goldene Vließ*; *Des Meeres und der Liebe Wälder*; *Der Traum ein Leben*, etc. He produced in lyric poetry much meritorious work; and one good prose novel, *Der arme Spielmann*. Died at Vienna, 1872.

**Grimm, Friedrich Meisler, Baron von**, German-French critic and writer, was born at Ratisbon, 1723. He became acquainted with Rousseau in 1749, and through him, with Voltaire and Madame d'Épinay. His connection with the encyclopedists, added to his own acquisitions, opened up to him a wide literary horizon. He was made a baron by the duke of Gotha, and appointed minister-plenipotentiary at the French court. At the outbreak of the revolution he fled, and afterward to the court of Catherine II., whence he was sent in 1793 as Russian minister to Hamburg. He died at Berlin in 1807.

**Grimm, Jakob Ludwig Karl**, German philologist and antiquary, was born at Hameln, in Hesse-Cassel, 1785. Though holding at various times important public offices, his life was devoted to philological and antiquarian studies. His German Grammar, in four volumes, is perhaps the greatest philological work of the century. In 1814, in company with his brother, Wilhelm, he published numerous works of a more popular character, the best known of which were *Deutsche Sagen und Hausmärchen*, nursery and fable stories. The greatest joint undertaking of the two brothers was the *Deutsche Wörterbuch*, begun in 1825. Jakob Grimm died in 1863. Wilhelm was born in 1786 and died at Berlin in 1859.

**Grimston (Grimston), R. See Kendal, Mrs.**

**Grimston, William B. See Kendal, Mr.**  
**Grisey (Grisey), Antoine Jean, Baron**, French historical painter, was born at Paris, 1771. He studied in the school of David, and acquired celebrity by several pictures of Napoleon, and in 1805, by *L. and Charles V. at Saint Denis*. "Departure of Louis XVIII. for Ghent," "The Plague at Jaffa," "Embarkation of the French in the Anjouin." He drowned himself in the Seine, 1833.

**Gross, Samuel David**, American surgeon, was born in Feenayville, 1828. He was graduated from Jefferson medical College, 1828; was professor of pathological anatomy in Cincinnati medical College, 1833-39; professor of surgery in University of Louisville, 1839-50; and at university of New York, 1850-61; professor of surgery in Jefferson Medical College, 1864-64. He wrote: *System of Surgery* (3 vols.); *American Medical Biography*, etc. He was the founder and chief editor of the *North American Medical-Chirurgical Review*, and was president of the American Medical Association, 1867. Died at 1884.

**Grubb (Grubb), F. D.**, American jurist, judge of United States circuit court of appeals, 7th circuit, since 1899, was born at Ashland, Ohio, 1822. He was graduated from Western Reserve Law School, 1847; practiced law at Ashland, Ohio, 1847-48, where he was city solicitor for six years; practiced from 1850-52 at United States judge of northern district of Illinois, 1892-99. He has been president of the John Reuben library, Chicago, since 1901.

**Grosvenor, Edwin Augustus**, educator, historian, was born in Newburyport, Mass., 1845. He was educated from Amherst, 1867. Andover theological seminary, 1872; LL. D., Wabash, 1903. Professor of modern governments and their administration, 1898-1907. Modern government and international law since 1901, Amherst College. Author: *The Hippodrome of Constantinople*; *Contemporary History*, etc.

**Grote (Grote), George**, English historian and politician, was born at Clay Hill, Kent, England, 1794. He published many pamphlets on reform, and contributed to the *Westminster Review*. In 1833 he was elected to parliament for the constituency of London, for which he continued to sit until 1841, as one of the "philosophical radicals." His history of Greece appeared in 1846. His *History of Greece* followed by *Plato and Other Companions of Socrates*. He died in 1871, and is buried in Westminster Abbey.

**Grotius, or De Groot, Hugo**, eminent Dutch scholar and statesman, was born at Delft, Holland, in 1583. He was descended from

a noble family, received an excellent education, and gave early manifestations of surprising talents.

In 1599 he commenced his career as advocate, and succeeded in being appointed historiographer, advocate-general of Holland and Zealand, a member of the states-general, and envoy to England. Hitherto his life had been marked by splendor, but it began to be clouded by the part which he took in the Arminian controversy. In 1613 he became syndic, or pensionary, of Rotterdam, and declaring himself on the Calvinist side, he incurred the wrath of the cause of the Arminians by his pen and influence. For this he narrowly escaped the fate of Barneveldt, (who suffered on the scaffold, and received sentence of imprisonment for life in the fortress of Loewestein. He remained in prison 18 months, which he had employed in writing his celebrated *Treatise on the Truth of the Christian Religion*, and then succeeded in escaping. This was effected by the management of his wife, who contrived to have him carried out of the castle in a chest that had been used for the carriage of books and linen.

Grotius at first sought an asylum in France; and it was during his residence there that he composed his great work, *De Jure Belli et Pacis*, on the Law of War and Peace. After an absence of 12 years, he returned to his native country, relying on the favor of Frederick Henry, prince of Orange, who had written him a sympathizing letter. But by a misapprehension of his enemies he was sent to perpetual banishment. He passed the remnant of his life in the diplomatic service of Sweden, and died at Rostock, in 1645.

He is the author of the most valuable treatise on international law, and extensive carrying. He was a profound theologian, a distinguished scholar, an acute philosopher, a learned jurist, and an erudite historian. Among his numerous works are: *De Imperio*, 1607; *De Antiquitate Reipublice Batavice*; *A History of the Goths*, etc.

**References.—Burgh's Life of Hugo Grotius.**  
**Gruchey (Gruchey), Emmanuel**, Marquis de, distinguished French marshal, was born in Paris, under the name of Gruchey, in 1752. He was lieutenant in the royal body-guard, 1787-93; served with Lafayette, was promoted brigadier-general, 1793; was afterwards employed in the Alps, aided in the conquest of Savoy, and after fighting in La Vendée, 1794, was cashiered as being unworthy of the office of general. He enlisted as a private soldier, and after the fall of Robespierre was reinstated and promoted general of division by a special decree. Defeated the Prussian cavalry at Zebendorf, 1806; was governor of Madrid, 1806; took part in the battle of Wagram, 1809; distinguished himself at Borodino, 1812; and commanded Napoleon's body-guard on the retreat from Moscow. When Napoleon repulsed the Elba, Gruchey was given a command and made a marshal of France for his successes in the north. He then marched into Belgium, defeated the allied English and Prussian armies at Fleurus and Liège, and by following Napoleon's orders to the letter to pursue Bücher is believed to have saved the French army from annihilation. He was again banished by the Bourbons, lived five years in Philadelphia, was recalled to France, 1818, in consequence of the revolution, was restored to rank as marshal and created a peer. Died, 1847.

**Grove, Sir George**, British engineer and writer on steam, was born at Clapham, 1820. He was trained as a civil engineer, erected in the West Indies the first two cast-iron lighthouses, and acted as the Britannia tubular bridge, and the United Kingdom and Wales. He was made D. C. L. by Durham, LL. D. by Glasgow, and was knighted in 1883 on the occasion of the Royal College of Medicine, of which he was director until 1895. He died in 1900.

**Grove, Sir Walter Robert**, English lawyer and physician, was born at Swansea, 1811. He studied at Oxford, was admitted to the bar, and called to the English bar, 1836. He was 1875-87 was a judge in the high court of justice. He greatly distinguished himself in the subjects of electricity and optics, and in 1839 he gave the powerful voltaic battery known by his name. He published very important lectures, in which he propounded the theory of the universality of the natural forces; the *Correlation of the Physical Forces*; *Volcanic Eruption*, and the *Electricity of the Atmosphere*. **Grundtvig (Grundtvig), Nikolai Frederik Severin**, Danish poet and theologian, was born at Udby in Denmark. He first learned his Latin in *Northern Mythology*, published in 1808, and *Decline of the Heroic Age in the North*, in 1809.

These were followed by the *Rhyme of Roskilde* and the *Heimskinde Saga*, and by a collection of patriotic songs. In 1815 he had begun the translation of the *Heimskinde Saga*, a masterpiece, in 1820 published a Danish translation of *Beowulf*, after 1861 he had the title of bishop, though he had not been since 1872.

**Grundy (Grundy), Fells**, American jurist and statesman, was born in Berkeley county, Va., 1777. In 1799 he was elected to the Kentucky constitutional convention, and from that time until 1806 served as a member of the legislature. He was elected to the supreme court of errors and appeals in 1806; in 1807, became chief-justice. In 1811 was sent to Congress, and re-elected in 1812. In 1813, as United States senator, to fill the unexpired term of John H. Eaton. Later he was elected to fill that place for a portion of another term. In 1838 he served for a few months as United States attorney-general, during the administration of Martin Van Buren; resigning the office he was immediately reelected to the United States senate. Died at Nashville, Tenn., 1840.

**Grusky, Carl Ewald**, civil engineer, was born in San Joaquin county, Cal., 1854. His first professional work was as a topographer with a surveying party of state engineering department of California, 1878; member of San Francisco Engineers' Association, 1880; member of the canal commission, 1904-05; consulting engineer, 1905-1907; and, since 1907, consulting engineer, New York.

**Guarini (Guarini), Giovanni Battista**, Italian poet and diplomat, was born at Ferrara, 1537. He was instructed by Duke Alfonso II. with diplomatic honors, and appointed ambassador in Venice, and Poland. His chief work was the famous pastoral play, *Il Pastor Fido*, really an imitation of his countryman, Jacopo Sannazaro. **Guericke (Guericke), Otto von**, German physicist, was born at Magdeburg, in Prussian Saxony, 1602. As a chemist he was distinguished by his discoveries relative to nature and effects of air. The experiments of Galileo and Pascal on the weight of air led him to attempt the creation of a vacuum. This resulted in the first air-pump, invented about 1650. Guericke's invention soon became famous, and in 1654 he was summoned to the presence of the emperor Ferdinand III. of Germany at Ratisbon, at which time he made the famous experiment of the vacuum. This was the "Magdeburg hemispheres," in demonstration of atmospheric pressure. Died at Hamburg 1686.

**Guggehem, Simon**, captain, United States Major-General, was born at New York, 1792. He was graduated from public schools of Philadelphia, after which he studied languages in Paris. He studied under Cuvier, and subsequently followed the more refined and ideal school of the Caracci, previous to finally striking out a style for himself. In 1808 he went to Rome where he remained for twenty years, and was a rival of Caracciolo. The "Aurora" of Guido was the best Italian painting of the Resurrection palace, a fresco of world-wide fame, is considered the greatest of his works. Died 1642.

**Guggehem, Carl**, German painter, was born at Munich, 1805. He was graduated from public schools of Philadelphia, after which he studied languages in Paris. He studied under Cuvier, and subsequently followed the more refined and ideal school of the Caracci, previous to finally striking out a style for himself. In 1808 he went to Rome where he remained for twenty years, and was a rival of Caracciolo. The "Aurora" of Guido was the best Italian painting of the Resurrection palace, a fresco of world-wide fame, is considered the greatest of his works. Died 1642.

**Gutierrez (Gutierrez), Juan**, soldier, and son of Tancared d'Hautville, was born in 1913. He defeated Leo IX. at Civitella, and, with his

brother Humphrey, became count of Apulia. Subsequently he rescued Gregory VII, from the emperor Henry V, invaded Italy, and died, 1055, when on another expedition against it, having defeated the fleets of the eastern emperor and Vladimir.

**Guise (gü-zé')**, a ducal family of Lorraine, was so named from the town of Guise. The most prominent members were Claude, duke of Lorraine (1490-1550), fifth son of René II, duke of Lorraine, was born at the chateau of Guise, in the Ardennes, and died, but after that campaign remained at home to defend France against the English and Germans. He suppressed the revolt of the duke of Lorraine, 1527, Francis created him duke of Guise.

Mary of Lorraine (1515-60), his daughter, in 1547 married Louis XII, duke of Orleans, and in 1553 James V, of Scotland, at whose death, in 1542, she was left with one child, Mary, Queen of Scots. During the troubles years that followed, the queen-mother acted with wisdom and moderation; but after her accession to the regency in 1554 she allowed the Guises to excite a rebellion, which continued to her death in Edinburgh castle.

Francis (1510-63), her brother, second duke, became one of the greatest generals of France. He and his brother Charles, duke of Guise, were conspicuous at the council of Trent, aimed to become all-powerful during the reign of Francis II. Heading the Roman Catholic party, they were triumphantly repulsed by the Protestants. Montmorency won a victory over the Huguenots at Dreux, 1562, and Guise was his murderer. He was assassinated by a Huguenot.

Henry (1550-88), third duke, fought fiercely against the Protestants in Flanders and Normandy, 1569, and forced Coligny to raise the siege of Poitiers. He was ambitious to succeed to the throne of France. His grandson, III, procured his assassination at Blois.

Henry (1614-64), his grandson, fifth duke, at fifteen became archbishop of Rheims, but in 1640 succeeded the dukeship. Having joined the league against Richelieu, he was condemned to death, but fled to Flanders. He was killed by the hand of Mazarin's revolt in Naples as the representative of the Anjou family, but was taken by the Spanish, 1647, and carried to Madrid where he remained a prisoner. After a second attempt to win Naples, 1654, he settled at Paris.

**Gutierrez, Juan**, physician, professor of general medicine and tropical diseases at the University of Havana, since 1900, was born at Matanzas, Cuba, 1852. He was educated at La Empressa, Madrid, 1870. M. D., University of Havana, 1875. P. D.; was professor of pathology, university of Pennsylvania, in charge of General Hospital as fellow expert in Sanitary Department, 1890. Member of *La Revista de Medicina Tropical*, and member of many medical and scientific associations.

**Gustaf (gü-stäf')**, **Frederick Guillaume**, French statesman and historian, was born at Nîmes, France, 1757. His first work, the *Nouveaux Mémoires Historiques de Sismogènes de la Langue Française*, appeared in 1809. He contributed to the dissolution of the *Chambre Inviolable* by writing a memorial which was placed in the hands of Louis XVIII, by Derogues. The latter committed to him the direction of the administration of the communes and departments in 1819. After the revolution of 1830, he became successively minister of public instruction, and minister of the interior, an office which he held, with two interruptions, until 1836, in 1847 he became the official leader of the cabinet, which maintained its ground in the policy of Louis Philippe's policy, until the revolution of 1848. Among his works are his *History of the English Revolution*; *Life of Oliver Cromwell*; *History of Civilization in Europe*; and *History of Civilization in France*. He died in 1874.

**Gustavus (gü-stä-vüs')**, **Frank Wakley**, Congregational clergyman, educator, was born at Cheshireville, Ohio, 1856. He was graduated at Wesleyan University, 1875. B. D., Beloit College, Wisconsin. Pastor of Memorial Congregational church, Baltimore, 1885-87; Plymouth church, Chicago, 1887-90; Central church, Chicago, 1890; president of Armour Institute of technology, since 1893; lecturer at Yale theological seminary 1882; general secretary of the Board of Christian Education, 1890; author of *Phidias and Other Poems*; *Stories of Night and Day*; *Transfiguration of Christ*; *Truth and Knave*; *Life of Jesus*; *How to Be a Stone*; *Metamorphosis of a Creed*; *November at Eastwood*; *Loaves Leaves of The Man of Galilee*; *Paula to Power*; *Paula to Power*; *Paula to Power*; *Ministries of Recent English Poetry*, etc.

**Gunter (gü-ntér)**, **Edmund**, English mathematician, was born in 1628 at Wotton, near Oxford, was educated at Westminster and Christ Church, Oxford. He invented the sector, with the lines drawn as Gunter's scale, and was the first in the invention of the surveying-chain, and the first observation of the variation of the compass. Died, 1626.

**Gustavus Vasa (gü-stä-vüs' vä-sä')**, king of Sweden, was born of a noble house at Lindholmen in Upland, 1496, and in 1518, during the patriotic

struggle with Christian II, of Denmark, was treacherously carried off to Denmark as a hostage. As a year was required to take him back to Sweden, where he strove in vain to rouse a spirit of resistance against the Danes. Retreating to the island of Åbo, he was confined to a room set on his head, and worked on floors and in mines. At last the infamous "blood-bath" of 1520, which was required for his release, Gustavus had an army large enough to attack the enemy. His capture of Stockholm in 1523 secured him the crown of Sweden, and he became king. He found the whole country demoralized. Yet after a forty years' rule he left Sweden a united and well-organized army. He died in 1560, and was succeeded by his eldest son, Eric.

**Gustavus VII.**, king of Sweden, was born at Stockholm, 1594. He was the grandson of Gustavus Vasa by his youngest son, Charles IX., at whose death, in 1611, he succeeded the throne of Sweden. He was acquainted with eight languages, five of which he spoke and wrote fluently, was well read in the classic and ancient history. He was proficient in music, and excelled in all warlike and many exercises. Having made various administrative reforms, and availing himself of the short interval of peace to promote the material prosperity of the country, he remitted the charge of the government to his son, Charles, in 1630, and set sail, in the summer of 1630, with an army of about 15,000 men, to aid the Protestants of Germany. He was a member of the League of Catholic League, which was backed by the power of the empire. With and for the Germans he fought at the death on the battlefield of Lützen, 1632. He made Sweden a power in northern Europe.

**Gustavus III.**, king of Sweden, was born at Stockholm, 1746, and succeeded his father, Adolphus Frederick, in 1771. In 1792 he was mortally injured at the theatre, and died in the opera house which he himself had built. Gustavus was a man of varied learning, and the author of several dramatic works and poems of considerable merit.

**Gustavus V.**, king of Sweden, was born in 1858, married, 1881, Princess Sophia, who was the first cousin of the German emperor, and a descendant of the old Swedish royal family of Vasa. He succeeded his father, Oscar II, on December 8, 1907, having several times previously acted as regent. The king's eldest son, Gustavus Adolf, was born at Stockholm, 1906. Margaret of Connaught, June, 1903. His majesty is a knight of the garter of Great Britain, and a knight of the Victoria Order, since April, 1906.

**Gutenberg, Johann**, or **Henne (gü-ten-bürd)**, the inventor of printing, was born in Mainz, Germany, about 1400, died 1468. His father's name was Gensfleisch. Gensfleisch, Gutenberg being the name of his mother, or of an estate belonging to his family, which was of noble lineage.

Gutenberg was a citizen of Mainz about 1420, where he appears to have devoted many years to mechanical experiments, and as early as 1438 he had a press, movable types, forms, and other appliances for printing. After 1444 all trace of him is lost till 1448, when he was again in Mainz. In 1450, he entered into a partnership with Johann Faust of Mainz for the purpose of carrying on the business of printing, the latter undertaking to furnish the funds. The partnership terminated at the end of five years, most of the materials being taken by Faust for his advance. Faust and Gutenberg agreed to have afterward carried on printing, with considerable activity alone.

In 1465 he abandoned the business, and entered the service of the archbishop-elect, Adolphus of Nassau. In his own words in modern times he has been obliged to share with Faust and Peter Schöffer the credit of his invention; but in the preface to a German translation of Livy (Münster, 1505) it is distinctly declared by Johann Schöffer that the "admirable art of printing was invented in Mainz in 1450 by the ingenious Johann Gutenberg." The opinion of modern writers seems to be that Gutenberg not merely invented the art, but practiced it long before he became associated with Faust.

**References.**—Varro's *De Lingua*, and the *Art of Grammar*; *Historia Gutenberg*; *Zatman's Gutenberg*; *Lamarine's Celebrated Characters*.

**Gutzkow (gü-tä-kö')**, **Karl Ferdinand**, German novelist and dramatist, was born at Stettin. He started a newspaper in 1831; went to Stuttgart to assist in editing *Münner's Literaturblatt*; was there three months, and then his writings expressed for the atheistic and scientific views upon religion in his novel, *Wally, die scerifera*, 1835, and in his name year elaborated *Die Wally, die scerifera*, a dramatic work. To escape the surveillance of the Prussian government he went to

Hamburg in 1837, thence to various German cities, and in 1870 made his permanent residence in Berlin. He was author of many novels, tragedies, dramas, and plays, which attained with popularity. Died, 1878.

**Guyot (gü-yot')**, **Arnold Henri Bouvier de la Motte**, French mystic, was born at Montargis, 1648. She was married at sixteen to Jacques Guyon, a man of twenty-eight, who was named to devote her life to the good and pious, and to the cultivation of spiritual perfection. At Paris, in 1670, she met the Marquis de Mouchy, where she finally settled in 1686, she became the center of a movement for the promotion of "holy wives" made their chief attraction. Her opinions, and for having been in correspondence with Molinos, the leader of the movement in Spain, she was arrested, and the authorities inquire into her teachings arose from controversy between Fénelon and Bossuet. Released by the intervention of Madame de Mouchy, after a detention of nine months, but again imprisoned in 1695, she was not released from the Bastille until 1702. She died at Paris in 1717.

**Guyot (gü-yot')**, **Arnold Henri**, Swiss geographer and geologist, was born at Neuchâtel, 1807. He came to America in 1848, and devoted his life to science; was professor of geology and physical geography at Princeton College, 1855-84. He formed an intimacy with Agassiz, and made numerous geological explorations, and wrote books. His greatest works were *The Meteorological and Physical Tables*, issued by the Smithsonian Institution, and his *Essays on Mass*, 1884.

**Haakon VII.** (gü-hä-kön'), king of Norway, was born at Christiania, 1872. He was a prince of Denmark, and a nephew of Queen Alexandra of Great Britain. His baptismal name was Charles, but he assumed the royal title on becoming king November 18, 1905, on the separation of Norway and Sweden. King Haakon and Queen Maud made their formal entry into Christiania November 25, 1905, and the king took the oath before the Storting on the 27th, and was crowned at Trondheim on June 22, 1906. He married Princess Maud Alexandra, daughter of King Edward VII., July 22, 1896. His son and heir apparent is Prince Alexander, born July 2, 1903, and renamed Prince Olaf on his father's accession to the throne.

**Hackett, William**, actor, was born at Wolf Island, Ont., 1869. He was graduated at the college of the city of New York, 1891, and studied at the University of Toronto, 1891-92. He appeared on the stage in Palmer's stock company, 1892; was leading man at New York Lyceum at twenty-nine, and at the Victoria Theatre, 1893-94. He was a successful actor-manager in America.

**Hading (hä-ding')**, **France**, stage name of Jeanne Hading, French actress, was born at Marcellines, France, 1859. At the age of three she played *Bianche de Cuytus* in *Le Boeuf*, her father at the same time playing the leading character. Some years later she was sent to the Marcellines conservatory, where she won considerable distinction. On leaving she entered upon an engagement at the Algiers theater, and when but fourteen played *Zouine* in *Le Fausset*, Stefano in *Claf d'argent* in *Coma*, the blind girl in *Les Deux Orphelines*, and Pedro in *Girofle-Girofla*. At the Palais Royal she played *La Châtre* in *Le Capitaine Corcoran*. She was the original Jolie Perrane and Belle Lurete, and the heroine in *Helène* and *Abelard*. She again appeared in *Claf d'argent*, *Pauline*, *Le Maître de Forges*. She subsequently appeared in London, 1894, and in 1895, 1896, and 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 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2882, 2883, 2884, 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2908, 2909, 2910, 2911, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2931, 2932, 2933, 2934, 2935, 2936, 2937, 2938, 2939, 2940, 2941, 2942, 2943, 2944, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2952, 2953, 2954, 2955, 2956, 2957, 2958, 2959, 2960, 2961, 2962, 2963, 2964, 2965, 2966, 2967, 2968, 2969, 2970, 2971, 2972, 2973, 2974, 2975, 2976, 2977, 2978, 2979, 2980, 2981, 2982, 2983, 2984, 2985, 2986, 2987, 2988, 2989, 2990, 2991, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 2999, 3000, 3001, 3002, 3003, 3004, 3005, 3006, 3007, 3008, 3009, 3010, 3011, 3012, 3013, 3014, 3015, 3016, 3017, 3018, 3019, 3020, 3021, 3022, 3023, 3024, 3025, 3026, 3027, 3028, 3029, 3030, 3031, 3032, 3033, 3034, 3035, 3036, 3037, 3038, 3039, 3040, 3041, 3042, 3043, 3044, 3045, 3046, 3047, 3048, 3049, 3050, 3051, 3052, 3053, 3054, 3055, 3056, 3057, 3058, 3059, 3060, 3061, 3062, 3063, 3064, 3065, 3066, 3067, 3068, 3069, 3070, 3071, 3072, 3073, 3074, 3075, 3076, 3077, 3078, 3079, 3080, 3081, 3082, 3083, 3084, 3085, 3086, 3087, 3088, 3089, 3090, 3091, 3092, 3093, 3094, 3095, 3096, 3097, 3098, 3099, 3100, 3101, 3102, 3103, 3104, 3105, 3106, 3107, 3108, 3109, 3110, 3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134, 3135, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3143, 3144, 3145, 3146, 3147, 3148, 3149, 3150, 3151, 3152, 3153, 3154, 3155, 3156, 3157, 3158, 3159, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3167, 31





**Mancock, John**, American patriot, was born in 1727. He was one of the leaders in the revolution in Massachusetts, the seizure of his sloop, *Liberty*, being the occasion of a riot in Boston. He was very active in denouncing the "Boston massacre" and was one of the persons whose seizure was attacked by the British expedition which led to the battle of Lexington. He was president of the continental congress from 1775-77, and governor of Massachusetts, 1780-83, 1787-93, and the first signer of the declaration of independence. He presided at the constitutional convention of 1780 and signed the constitution of the proposed federal constitution. Died, 1793.

**Hancock, Winfield Scott**, American general, was born in Pennsylvania, 1824. After graduating at West Point in 1844, he served with great gallantry during the Mexican war. Appointed brigadier-general of volunteers in 1861, he took part in the campaign on the Potomac, fought at Antietam, and commanded a corps in the battle of Gettysburg, where he was wounded. In 1863, in 1864 he became brigadier-general in the regular army, in 1866 a major-general. At his death, in 1886, he was in command of the department of the East.

**Handel, George Frederick**, noted German musician, was born at Halle, Saxony, 1685. At ten years of age he composed a set of sonnets. In 1703 he went to Hamburg, where he played a violin in the orchestra of the opera. He was soon its director, and composed his first opera, *Almira*, which was rapidly followed by *Nero*, *Florinda*, and *Daphne*. His violent temper involved him in a quarrel with a brother-composer, which resulted in a duel; the sword of his adversary was stoned by a button or a music score.

He next visited Italy. In Florence he composed *Rodrigo*, 1709. His *Agrippino*, composed in Venice, had a run of 30 nights. At Rome he produced his *Il Trionfo del Tempo*. At Naples he composed *Acis and Galatea*, and in 1710 returned to Germany, where he was appointed chapel-master to the Elector of Hanover, afterwards George I.

Editor of *Insoliver*, after which George Handel moved to England and there he was patronised by Queen Anne and her nobility. He composed *Rinaldo*, *Giulio Fido*, *Theseus*, and in 1715, *Amadis de Gaul*, in which Nicolini and Valentini first sung in England. The opera was an exotic hit in England, and a plant of slow growth. A royal academy of music was formed, and after some competition was placed under Handel's management; but his overbearing temper could not cope with musical jealousies. An opposition house was started, and both

He now began the composition of his oratorios. *Israel* was produced in 1735 and is followed by *David*, *Samson*, *The Feast, and Esther in Egypt*; and in 1740 appeared *L'Allegro e Pensoso*, and *Samson*. These were produced in the Lincoln's Inn Fields theatre, but with no profit. Even the *Messiah*, the most sublime of his compositions, was at first a failure. Tired of this titanic struggle, Handel went to Dublin, where he remained nine months, and received a generous support. On his return to London he composed his *Samson*, and produced his *Messiah* for the benefit of the Foundling Hospital. It was repeated annually for the same purpose, and from 1749 to 1777 brought to that society £51,500.

Handel became blind, but he still composed and played on the organ, being led to his seat, and forward to receive the plaudits of the audience. Died 1759.

**References.**—Marshall's *Handel*; Rockstro's *Life of G. F. Handel*; and the German life by Chrysander.

**Manly, J. Frank**, lawyer, ex-governor of Indiana, was born in St. Joseph, Ill., 1863. He was educated in common schools, Champaign county, Ill., taught school for nine years in Warren county, Ind., and was admitted to the bar in 1889. He practiced at Williamsport, Ind., 1889-96; was elected to the state senate, 1890-92; elected to congress, 1894, serving one term, and was a candidate for the United States senate in 1896.

1899. He was governor of Indiana, 1905-09. Hanna, Marcus Alonso, American politician and legislator, was born in New Lisbon, Columbus county, Ohio, 1837. He began his career in his father's wholesale grocery house. In 1867 entered the firm of Rhodes and company, dealers in coal and iron, and ten years later the firm name was changed to M. A. Hanna and company. He was appointed to the United States senate as a republican by Governor Ruebush, 1897, to fill vacancy caused by the resignation of John Sherman, who resigned to accept the position of secretary of war.

tary of state in President McKinley's cabinet, and took his seat March 5, 1897. His term of service under the appointment expired in January, 1898, and he was elected for a full term, and served until his death in 1904. He proved a remarkable political organizer, was a man of excellent judgment, and an effective debater.

**Hannibal**, Carthaginian general, the famous son of Hamilcar Barca, was born in 247 B. C. At the age of nine years he accompanied his father on his expedition to Spain, and therefore starting from an early age he was imbued with the spirit of hatred to the Roman name. He attacked Saguntum, a city in alliance with Rome, for making agreements on the Torbotoles, subjects of Carthage. After eight months' siege, the city was taken, and the Romans, after unsuccessfully demanding the surrender of the general who had thus wantonly violated the treaty, declared war in 218 B. C. Hannibal started from New Car-

211B 215 B. Marius killed Varro and about 12,000 of his men. Varro was killed by the Pyrenaees he marched to this Rhone without opposition, since Scipio was at Massilia (Marseilles), four days' march from the Pyrenaees. He sent a detachment of 10,000 men of the Celtic horde who aided with their Romans. He collected the passages of the Alps in five days, in spite of the attacks of the mountaineers. He then moved on to the Pyrenaees. Scipio, having returned from Massilia, took command of the army in the north of Italy, and first met Hannibal on the plain near the river Trebia. Scipio, severely wounded, retreated across the Po. Hannibal next inflicted a severe defeat near Lake Thymene, on the consul Flaminius. He then moved on to the Alps, and in the autumn, in October, in August, 216 B. C., almost annihilated the Roman army of 90,000 men under Terentius Varro and Aemilius Paulus. In this battle about

50,000 are said to have fallen, including Hannibal's own army. The Roman survivors were few. The Romans, surprised the Roman general, defeated their army, captured their towns. The defeat of Hannibal, which was the end of the Punic Wars, and the loss of his army, compelled Hannibal to confine himself to the mountainous peninsula of Iberia, where he remained for the rest of his life. He made the Romans to dialogue him. At length, after having maintained himself in Italy for upward of fifteen years, he was recalled to Rome, where he was put to death. Hannibal was notwithstanding his utmost exertions and the bravery of his veteran troops he was defeated. The surrender of Hannibal was one of the conditions of peace; but, foregoing such a result, he committed suicide by taking poison. 183 B. C.

**Capgood, Isabel Florence**, author, was born in New York City, 1855. She was educated at Worcester, Mass., and at Miss Porter's school, Farmington, Conn., 1865-68. Author: *The Epic Songs of Ruano; Russian Reminiscs; A Survey of the Russian Literature; The Russian People*. Translations of standard works from Spanish,

**Haggood, Norman**, editor, author, and critic, was born in Chicago, Ill., 1868. He was graduated at Harvard, 1890; LL.B., Harvard law school; A. M., 1893. Author: *Literary Statesmen*; *Daniel Webster*; *Abraham Lincoln*; *The Stage in America*, etc. He was dramatic critic of New York *Commercial Advertiser*, and *Bookman*, 1897-1902.

and has been editor of *Collier's Weekly* since 1903.

**Harahan, James Theodore**, president of Illinois Central railroad company 1906-1911, was born at Lowell, Mass., 1843. He rose step by step in the service of the Orange and Alexandria railroad, the Nashville and Decatur, and the Louisville and Nashville, from 1864 until he became general manager of the latter, 1885. He was then succe-

sively assistant general manager of the Lake Shore and Michigan Southern railway, general manager of the Chesapeake and Ohio, and later of the Louisville, New Orleans and Texas railway until 1890, when he became second vice-president of the Illinois Central railroad.

**Harben, William Nathaniel.** American novelist, was born at Dalton, Ga., 1858. He was educated at high schools and privately. He has traveled extensively, and was associate editor of the *Youth's Companion*, Boston, 1891-92. Author, *W.A.'s*

Companion, Boston, 1891-93. Author: *Walt  
Marie; Almost Persuaded; A Mute Confessor;  
The Land of the Changing Sun; From Clue to Climax;  
The Caruthers' Affair; Northern Georgia Sketches;  
The Woman Who Trusted; Westerfelt; Abner Daniel;  
The Substitute; The Georgians; Pats Baker; Ann  
Boyd; Mam' Lindy; Gilbert Neal, etc.*  
**Hardenberg** (har-den-berk), Karl August, Prince  
son, Dusseldorf, 1818-1890. Works: *Die Kunst des*

rod, Prussian statesman, was born at Kessenrode in Hanover, 1760. In 1791 he became a Prussian minister, and in 1802 Prussian minister of war. In 1810 he was appointed chancellor, and addressed himself to the task of completing the reforms begun by Stein. In the war of liberation he played a prominent part, and after the treaty of Paris, in 1814, was made a prince. He took part in the congress of Vienna, and in the treaties of Paris. To Hardenberg Prussia is mainly indebted for the improvements in her army system, the abolition of serfdom, and the release of the nobles, the encouragement of municipalities, and the reform of education. Died, 1822.

**Jardine** (har'-di), **James Ketr**, British labor leader, member of parliament for Merthyr-Tydvil since 1900, was born in Scotland, 1856. In 1895 he was an unsuccessful candidate for East Bradford. He was appointed editor of the *Cummock News* 1882, but resigned in 1886. He visited India and Australia, 1907; founded the *Labor Leader*, and has been a frequent contributor to magazines and reviews.

**Reading, Samuel Bannister**, university professor, born in Indianapolis, 1866; graduated from Indiana University, 1890, Ph. D. Harvard, 1895. His history, *Indiana University, since 1895*, (collaborated with wife), *The City of the Seven Hills* (with name); *The Story of the Middle Ages: Essentials in Medieval and Modern History*; *Select Orations; The Story of England* (with W. F. Hardison); etc.

**Henry, Viscount**, English general, governor-general of Madras, India. He was born at Wrotham, Kent, 1785. Gained an ensign in 1798, he served through the Peninsula war. From 1803 to 1805 he was in the East India Company's service, and in 1805 he was promoted to the rank of general of the Portuguese army. From 1826 to 1844 he took an active share in parliamentary life, being secretary of war under Wellington in 1828, and afterward chief secretary for Ireland. He was married to a daughter of the Duke of India. After the peace of Lahore in 1845 he was created a viscount, and granted a pension of 5,000 pounds by the East India company, as well as a baronetcy. He was sent to the continent to England in 1848, he succeeded Wellington as commander-in-chief in 1852, and in 1855 was made field-marshal. He died at South Park, Tunbridge Wells, Kent, 1862.

**Wells, Arthur Sherburne**, diplomat, author, was born at Andover, Mass., 1847. He was graduated at Harvard, 1869, served two years in 36<sup>th</sup> United States artillery; was professor of civil engineering, Iowa college, 1871-73; was editor of the *Cosmopolitan Magazine*, 1893-95; United States minister and consul-general, Teheran, Persia, 1897-99; minister of United States to Greece, Roumania, and Servia, 1899-1901; to Switzerland, 1901-03, and to Spain, 1903-05. Author: *Elements of Quaternions; Elements of Conics; Elements of Algebra; Geometry; New Methods in Topographical Surveying; Imaginary Numbers*; etc.; several novels, etc.

**ALBY, Thomas**, English novelist, though educated as an architect, was born in Dorsetshire, 1840. The scenes of his novels are chiefly laid in the West-Indian colonies. His principal works are: *Indiscreet*; *The Greenwood Tree*; *For Ever the Madding Crowd*; *The Return of the Native*; *The Trumpet Major*; *The Woodlanders*; *Tess of the D'Urbervilles*; *Jude the Obscure*; *Middlemarch*; *The Weymouth Estate*; *Poems*; *A Poem of the Past and the Present*; *The Dynasts*, a drama, etc., are by Augustus John Cuthbert, English author, born in Rome, 1862. He studied at Balliol College, Oxford. He wrote the famous and often reprinted *Walks in Rome*; *Wanderings in Spain*; *Days near Rome*; *Cities of Northern Italy*; *Italy: From Florence to Naples*; *Southern Italy and Sicily*; *Rome and Environs*. Other works are his delightful biography of Maria Edgeworth; *Memorials of a Quiet Life and Letters of Thomas Burnam*; *Two Noble Lives*.  
Died, 1934.

Ed. Johns, 1905.  
 John, English actor, was born in London, 1844. He was educated at Giggleswick grammar school, Yorkshire, and obtained an engagement at a London theater, 1865. In 1875 he became manager of the Court theater, and 1879-88 maintained a partnership with W. H. Kendal. From 1889 to 1895 his tenancy of the Gaiety theater was important for his production of *La Tosca* and *A Pair of Spectacles*, the latter possibly his greatest success. He visited the United States, 1890-97.

and again in 1900.  
**argaves** (*adr'-grès*), **James**, English mechanio and inventor, was born probably at Blackburn, England, about 1748. He was an illiterate weaver and carpenter of Stanhill near that town. In 1760 he invented a carding-machine, and about 1764 the spinning-jenny. He removed to Nottingham, where he secured a spinning-mill, but his patent proved invalid. He continued to carry on his business as a yarn manufacturer until 1827.

**arkness** (ark'-ness), **Albert**, American classical scholar, was born at Mendon, Mass., 1822. He was graduated at Brown University in 1842, studied at Berlin, Bonn, and Göttingen, and became professor of Greek in Brown University in 1855. He published a series of Latin classics, and a standard *Latin Grammar* which has been widely used. Died 1907.

widely used. Died, 1907.

**arion** (*Ar-ee-on*). **John Marshall**, jurist, associate justice of the United States Supreme Court, born in Virginia, 1753; died, 1835. He was graduated at Centre College, Ky., 1830; LL.D., Bowdoin, 1883. Studied law at Kentucky University, practiced at Frankfort, Ky., removed to Louisville in 1807 and practiced law there. Colonel of 10th Kentucky regiment in Union army, 1861-63; attorney-general of Kentucky, 1863-67; his name was presented for vice-presidential election in Kentucky for vice-president of United States in 1872; member of Louisiana commission, 1877; one of American arbitrators











remarkable equanimity and even good-humor, until the day of his death, which took place in Paris, 1866.

**Heraeus**, comedienne, was born in Paris, 1877, daughter of Maurice Heide. She was educated in an academy at Rouen, France, and married in 1897. *Le Figaro* and *Le Monde* reported her debut as comedienne in Paris, 1890; since then in many roles; began starring, 1896, in *French Music*; *Papier's* *Revue des Variétés* (the first way theater, New York); in *Parisian Model*, *Drury Lane theater*, London; in United States in *The Little Duckies* (London) and *The Little Duckies* (London), New York, etc.

**Heinrichs, Herman von**, German scientist, born at Bielefeld, 1827. He was a professor of physiology at Königsberg in 1849, at Bonn in 1855, and at Heidelberg in 1858. Although his earlier researches were mainly physiological, he took rank as a physicist and mathematician in 1847, when he published his striking tract on the *Conservation of Energy*.

Naturally gifted with a powerful mathematical mind and a profound physical intuition, he gave a new direction to physiological research in optics and sound. His *Sensations of Tone* and his *Physiological Optics* were epoch-making works. Moreover, he had created a new field in hydrodynamics by his famous investigations on vortex motion; and his inquiry into the connection between sensation and knowledge led him to the study of the foundations of geometry.

He was called to Berlin in 1871, to fill the chair of physics. His contributions to the theory of electro-dynamics, in which he aimed at greater generality than in 1847, when he was his theory, are of great importance; and it was at his instigation that Hertz demonstrated the existence of Maxwellian electromagnetic waves. He enriched the theory of thermo-dynamics by his discussion of "monocyclic" systems, and in his later papers endeavored to get at the real essence of the principle of least action. Although the idea was first put forth in Maxwell's writings, Heinrichs was the first to work out explicitly the notion of the electric atom or electron, as it is now called. From 1887 until his death, in 1894, he was director of the technological institute at Charlottenberg, near Berlin.

**References**.—M'Kendrick's *Life in Masters of Science Series*, in German by Heinrichs; and article by Prof. Rucker in the *Forthrightly Review* for Nov., 1884.

**Hennippen** (*Hen-nip-pen*), *Belgian* chemist, was born at Brussels in 1877. In 1909 he settled at Vilvorde, near Brussels, where he practiced medicine gratuitously for the poor. He was the first to point out the imperative necessity for employing the balance in chemistry. He paid much attention to the study of the gases, and is supposed by some authorities to have been the first to apply the term gases to elastic aërial fluids. Of these gases he distinguished several kinds. His works were published under the title *Opera Medica*. Died, 1644.

**Holpe, Sir Arthur**, English essayist and historian, was born at Streatham, 1813. He was graduated at Cambridge in 1836, and on leaving the university obtained a post in the East India Company, then resigned and retired to Bishop's Waltham, in Hampshire, where, in the possession of ample leisure, he enjoyed literary and historical pursuits. His most important work, *History of the Consequence* was entitled *History of the Consequence of the Consequence*. Died, 1876.

**Martheussen**, Dutch painter, was born at Haarlem or Dordrecht, between 1611 and 1614. He was joint-founder in 1654 of the painters' guild of the city of Amsterdam, where he attained great celebrity as a portrait-painter. His best-known work is *The Death of the Prince of Orange*, now in the Amsterdam gallery. He died in 1670.

**Melville** (*Mel'-shu-n*), *Claude Adrien*, French philosopher, was born at Paris, 1718. He appeared his celebrated work *De l'Esprit*, in which he endeavored to prove sensation to be the source of intellectual activity, and that the shorter lever of all human conduct is self-satisfaction. He visited England in 1764, and the year following was entertained by Frederick the Great at Berlin. His complete works were published after his death. Died, 1771.

**Hemans** (*He-mans*), *Felicia Dorothea*, English poetess, was born at Liverpool, 1789, daughter of George Browne, a Liverpool merchant, and became the wife of Captain Hemans. Her best poem is *The Power of Solitude*, but her shorter pieces, published under the title of *Songs of the Affections*, etc., are by far the most popular. Many of these shorter pieces have become standard English lyrics, and upon them, almost exclu-

sively, depends her claim to remembrance. She died in Dublin, 1835.

**Henderson, Charles Richmond**, American educator, sociologist, professor of sociology at the University of Chicago, since 1892, was born at Covington, Ind., 1848. He was graduated at the University of Chicago, 1870; B.D., 1873; Ph.D., 1882. Served as Union theological seminary; Ph.D., Leipzig, 1901; Associate editor of *American Journal of Sociology*, 1897-1902; Editor of *American Journal of Sociology*, 1902-1903. Author: *Introduction to Study of Dependents*; *Social Spirit in American Social Settlements*; *Edited: Studies and Lectures: Elements of Sociology*; *Modern Methods of Charity*; *Modern Social Hygiene*, etc.

**Hendricks, William James**, American writer, musician, was born at New York, 1802, was born at Newark, N. J., 1858. He was graduated at Princeton University, 1876. Was a member of staff of *New York Tribune*, 1876; *Times*, 1883; *Music critic*, 1887-1902. Author: *Story of Music*; *Trifles and Studies*; *Elements of Music*; *What is Good Music? How Music Developed*; *The Orchestra and Orchestral Music*; *Richard Wagner*; *Modern Musical Drift*; *Pipes and Tambors*; *Piano*; *The Art of the Singer*, etc. Associate editor, *Standard Dictionary*.

**Hendricks, Thomas Andrews**, vice-president of the United States in 1885, was born in Muskegon county, Ohio, 1819. Graduated at Hanover College, Ind., and was admitted to the bar in 1842. He was a democratic member of the house of representatives, 1851-55, served as United States senator, 1868-69, and as governor of Indiana, 1873-77. In 1876 he was nominated for the office of vice-president of the United States by the democratic party, but was defeated. In 1880, and 1884 he was a prominent candidate for the nomination for the presidency, and in 1884, after the election, was nominated as vice-president and was elected. He died at Indianapolis, Ind., 1901.

**Henry, Francis Joseph**, lawyer, was born in Lima, N. Y., 1859, and has been a resident of San Francisco since 1884. He was engaged in cattle business in Arizona, 1885-89; practiced law, Tucson, Arizona, 1889-90; and was general counsel of the city of San Francisco, 1890-91. He was removed to San Francisco, 1895, and continued cases to civil business until discharged by United States marshal, 1896. Known to many as a lawyer, he was removed to Portland, Ore., to investigate conspiracy of United States Attorney John H. Hall to protect himself in consideration of a bribe for removal; secured removal and indictment of Hall, and indictment of Senator Mitchell, George C. Peck, and others. He was removed to San Francisco, 1896, and was defeated for reelection in 1900.

**Hennippen** (*Hen-nip-pen*), English poet, playwright, critic, and editor, was born at Gloucester, 1849. Months of illness in Edinburgh infirmary, 1873-75. Author: *Heavenly Bodies*; *Heavenly Bodies of Venus*, which won much attention, and was followed by *Venus and Beries*; *The Song of the Sword*; *For England's Sake*; *Howland's Lover*, etc. He edited the *Magazine of Art*, the *Sports Observer*, and the *New Review*, besides an edition of Burns. He also collected with R. L. Stevenson in four plays, *Deacon Brodie*; *Dean Austin*; *Robert Macaire*, and *Admiral Guichen*. He died in 1903.

**Hennippen** (*Hen-nip-pen*), *Louis*, French priest, missionary and traveler, was born in Belgium about 1840. When La Salle undertook his exploration of the Mississippi valley, Father Hennippen was assigned to his command. They discovered the mouth of the river, and then returned to La Salle, and thence to Peoria, on the Illinois river. Here La Salle was obliged to leave the party, and Father Hennippen was left in command. He followed the Illinois river to its mouth, and thence north to the Mississippi, a journey of some six weeks, when he died of a fever. He was buried at Peoria. His Father Hennippen spent nearly a year among the Indians, and was finally rescued by Du Luth, after which Du Luth was named. His return to Europe, Hennippen published a history of his travels, which is of the greatest value in dealing with the early explorations of the Mississippi valley. Died at Utrecht about 1708.

**Henry I., king of England**, youngest son of William of Conqueror, was born in 1068. He was crowned fully held the crown against his brother Robert, at first negotiating with him, and granting him a charter, but then he was forced to fight, and making war against his badly governed duke. Robert was defeated in a bloody battle before the siege of Merton, 1106, taking the duke's life, and shut up in Cardiff castle during the remaining twenty-eight years of his life. The acquisition of the throne by Henry I. was a great triumph, had been a point of ambition with Henry, but he had some trouble in keeping it, as the French king, Philip I., was the constant enemy of his, and Flanders took part with William, Robert's youthful son, whose virtues and misfortunes secured him the sympathy of Henry, however. Henry, himself the count of Anjou; he rendered neutral, by his eloquence and fair promises, Pope Calixtus II. and the archbishop of Canterbury, and his mailed knights in the almost bloodless battle of Brun-

vill, 1119. Next year his successes in arms and intrigues were darkened for life by the death of his only son William, who was drowned at sea on his journey to the Holy Land. Henry's reign was styled *Becket's*, or "the scholar." In honor of his learning, which, for a king in his age, was not unduly common, he was called "the scholar."

**Henry II., king of England**, grandson of Henry I., was born in 1133. He was crowned with his queen, Eleanor, at the age of 15. He was the duke of Aquitaine in her own right. Henry inherited from his father Anjou, Touraine, and Maine, and his mother and his father's half-sister, Matilda, kept and taking possession of Normandy for themselves and him; so that, by one method and another, he came to be possessed of a large portion of France as well as England. His chief rivals in power were the clergy. To add him in reducing the church to subjection, the civil power he appointed his trusted chancellor, Thomas a Becket, to the see of Canterbury, and compelled him, and the other ecclesiastics, to agree to the constitutions of Clarendon. Becket, however, proved to be a true churchman, and the long and obstinate struggle between him and his monarch was only terminated by his murder. During his reign occurred the conquest of Ireland. This was a nominal conquest, for the majority of the Irish tribes and chieftains continued to be independent. However, Henry's son, Richard I., rebelled against him, and their cause was supported by the pope. Henry was defeated, and the course of this filial rebellion Henry, the eldest, died of a fever, and Geoffrey was killed in a tournament at Paris. Henry's son, Richard I., was crowned at Lion, with King Philip of France, obtained some advantages over his father. A treaty of peace was concluded between them, by which the stipulations were for an indemnity for all the followers of Richard. Died, 1189.

**Henry III., king of England**, son of Henry II., and eldest son of King John, was born in 1207. He came to the throne in 1216 when a minor, and in the course of his reign he showed much hostility by his foreign favorites and his submission to papal exactions. This discontented the nobles, and they rebelled against him, and he was defeated and compelled to submit to control of the government by De Montfort and his friends. During his reign the great charter, with important clauses omitted, was frequently renewed and Westminster abbey was almost entirely built. Died, 1272.

**Henry IV., king of England**, first king of the house of Lancaster, was born in 1367, and succeeded Bolingbroke in 1399. He was crowned in 1400 he was made earl of Derby, and married Mary de Bohun. In 1397 he supported Richard II. against George of Clarence, who was banished. Upon the death of his father, John of Gaunt, his estates were forfeited. In July, 1399, he was crowned king. He was banished in 1400 on September 29th he obtained from Richard, then a prisoner in the Tower, an abandonment of his claim to the throne. He was crowned in 1400 Henry arose in parliament and claimed kingdom and crown. In 1412 he sent two expeditions into France, but in his closing years he was afflicted with epileptic fits, in one of which he died at Westminster, 1413.

**Henry V., king of England**, was born at Monmouth, 1387, eldest son of Henry IV. by Mary de Bohun. He was crowned in 1413, and at the outset of his reign liberated the young earl of March, his heir to the crown, restored Hotspur's son to his father's lands and honors, and had Richard II. buried in Westminster. The great effort of his reign was an attempt to conquer France; and in 1414 he defeated the French crown, to which he was believed to have gained a valid claim through his great-grandfather, Edward III. He was crowned in 1419, and in 30,000 men and in September took Harfleur. In October, at Agincourt, he gained a battle against the French, and in 1420 he was crowned at Reims. In 1420 was concluded the "perpetual peace" of Troyes, under which Henry was recognized as king of France, and married the French king's daughter, Catharine of Valois. In 1421 he took his young queen to England, but he died in 1422, and was recalled by the news of the defeat at Beaugé of his brother, the duke of Clarence. Henry's contest with France was a great success, and he died with illness, and died at Vincennes, 1422, leaving an infant to succeed him.

**Henry VI., king of England**, was born about 1457, first of the Tudor dynasty. He was the son of Edmund Tudor and Margaret Beaufort, a descendant of John of Gaunt, and was crowned in 1469, and defeated Richard III. at Bosworth, after which he married Elizabeth, daughter of Edward IV. He was a weak and feeble monarch, and was defeated by the measures he enforced against the nobles, by his system of marriages with French princesses, and by the enactment of Foyning's law. Died, 1509.

**Henry VIII., king of England**, second son of Henry II., was born at Greenwich, 1491. He was crowned at twelve, he was married to 1500, shortly after his accession, to Catharine of Aragon, his first bride, and he was a weak and feeble monarch, his ministers wisely, and, leaving much to their

discretion, and leaving much to their



















verities at Cambridge, London, and Birmingham. Author: *Chronicle of Henry VIII*; *Calendar of Spanish State Papers*; *Bluebook*, 4 vols.; *The Loss of the Fair of Mary Queen of Scots*; *Calendar of the History*, vols. iii. and iv.; *Queens of Old Spain*; *The Court of Philip IV.*, etc.; and many historical articles in the *British* and *English* and *Spanish* magazines and reviews.

**Stumpelrieder** (*ahn-pir-ah-dor*), Engelbert, German composer, was born at Cologne, Prussia, 1854. He studied music at Cologne, Frankfurt, Munich, and Berlin. In 1890-96 at the latter he was director of the orchestra of the musical fairy play, *Hansel und Gretel*, which was phenomenally successful, compositions that have earned for him the name of "the Wagner of the North Sea." In 1900 he became professor of music at Berlin.

**Stumpelrieder** (*ahn-pir-ah-dor*), Milton Wylie, American educator and scholar, professor of Greek, University of Virginia, since 1887, was born in Greenbrier county, Va. (now W. Va.), 1844. He was graduated at Washington and Lee, A. M. 1869; Ph.D., Leipzig, 1874; LL.D., Vanderbilt, 1893. He was professor of Greek, Vanderbilt University, 1875-83, and professor of Latin and Greek, University of Texas, 1883-87. President in 1882-83 of the American philological association, and was ten years American chief editor to *Revue de Philologie*, Paris. Edited, with notes: *The Clouds of Aristophanes*, The Athenians, The Frogs, etc.

**Stuckey** (*ahn-ster*), James Gibbons, journalist, music critic, was born in Philadelphia, Pa., 1860. He was graduated at the University of Pennsylvania, Philadelphia, 1873; studied law and conveyancing at law academy, Philadelphia, five years. Music and dramatic critic at *Philadelphia Ledger*, 1886-96, and of the *Morning Advertiser*, 1896-97. He was formerly music and dramatic, now art editor, of the *New York Times*. He has written *Modern Music*; *Vocalists*, etc. He also wrote the article on music, *New International Encyclopedia*, and has been contributor to leading magazines.

**Stunt, James Henry Leigh**, English poet and essayist, was born at London, England, 1818. In 1813, as editor of *The Examiner*, he wrote some articles severely criticizing the prime minister, Edward George Peacock, and for them he was prosecuted by order of the government, and sentenced to two years' imprisonment in the Surrey jail. While in jail he wrote *The Plebeian's Letters to Masefield*; *The Story of Rimini*, an Italian tale in verse; and *The Feast of the Poets*. In 1828 he published *Lord Byron and some of his Contemporaries*, in which, having quarreled with Byron during a visit to Italy, he indulged in some severe animadversions upon the character of the poet, and his last work was his *Autobiography*. He died at London, England, 1865.

**Stunt, Thomas**, British, American chemist and geologist, was born in Connecticut, 1825. In 1847 he became assistant to Professor Williamson in his chemical laboratory at Yale College, and in 1847 was appointed chemist and mineralogist on the geographical survey of the United States. He held this post more than two-and-a-half years, resigning in 1872 to accept the chair of geology in the Massachusetts institute of technology. He furnished many important articles in his specialty to Appleton's *American Cyclopaedia*, and was a member of the leading scientific bodies of both continents. He died in New York, 1892.

**Stunt, Walter**, English painter, was born in Middlesex, England, 1811. He has been a constant exhibitor at the royal academy since 1831. The following are among his best pictures: *A Boy's Play*; *A Father-Mother*; *An Orphan*; *Our Father—He Finds*; *Maternal*; *An Old Offender*; *Home from Work*, etc.

**Stunt, William**, painter, creator of the English school of water-color painting, was born in London, 1760, the crippled child of a upholsterer worker. He was ranked by Ruskin as the greatest painter of the school. He generally painted very simple subjects for his pictures, such as: *Fishes and Reptiles*; *Old People*; *Wild Animals*; *The Red Fox*; *Asleep*, etc., but they are conceived in a finely poetical spirit, and present the perfection of finish. Died, 1844.

**Stunt, William Holman**, English painter, was born in London, 1827. In 1845 he was admitted a student of the royal academy, and a next year exhibited his first picture. He shared a close study with D. G. Rossetti, and the two, along with Millais and a few others, inaugurated the Pre-Raphaelite brotherhood, which aimed at a detailed and uncompromising truth to nature. Among the first of the *Pre-Raphaelite Brotherhood* was *The Light of the World*, which he painted at Oxford. In 1865 he was nominated to the order of merit, and was made a D. C. L. by Oxford. Died 1910.

**Stunt, William Morris**, American genre and portrait painter, was born in Brattleboro, Vermont, 1824. He was educated at Dummerston, and came to France; but he never became a member of the French school studied by his own original ideas, and was one of the first to introduce the representation of the French school into the United States. Among his productions are: *The Lost Kid*; *The Characters*; *Bugle Call*, etc. He painted *The Fight*

of Night and other decorations in the state capital at Albany, N. Y. Died, 1879.

**Swain**, James, noted British surgeon, anatomist, and physiologist, was born at Broom's Barn, Kent, 1728. He spent five years at the University of Edinburgh, and went to London and studied at St. George's hospital. His specialty was surgery was so rapid that in the second month he was able to undertake the directing of the amputation of the arm of a patient who was discharging from his health gave way, and in 1759 he applied for an appointment in the British army, and was sent to Belle Isle, and afterward to the Peninsula. In 1767 he was elected a fellow of the royal society, and the following year he was appointed surgeon to St. George's hospital. In 1770 he was appointed surgeon-extraordinary to the king. He was famous for the cure of aneurism, the result of simply tying the artery at a distance from the tumor, and between it and the heart, has been most fruitful and important results than any since Ambrose Pare's application of ligatures to divided arteries. He died in 1793.

**Swainston** (*ahn-steen-don*), Melina, Countess of, daughter of Earl Ferrers, was born in 1707. She married the earl of Huntington, 1725, and became a widow in 1745. Joining the Methodists in 1739, she made Whitefield her chaplain in 1749, and assumed a leadership among his followers, who called her as "the Christiana of a Unitarian's connection." She died in London, 1791, bequeathing to four persons her sixty-four chapels, which have become identical with the Congregational churches.

**Swainston, Daniel**, American painter, was born in New York, 1816, and was educated at the College. In 1835 he began to study art under Moreau, and still later with Inman. In 1859 he visited Europe, and became a resident of New York, and painted the portraits of many of the leading men of the time. He was best known by his picture, *The Republican Court in the White House*, in which there are more than sixty figures. Died, 1900.

**Swanyad** (*ahn-yad-d*), János, Hungarian general, was born at Hunyad, Transylvania, about 1837. He was governor of Transylvania in 1845, and distinguished himself against the Turks, who at that time were the terror of the whole of Christian Europe. He was killed at the battle of Kistelek, near the city of Belgrade, where the monk John Capistrano, carrying the holy cross, raised the enthusiasm of the Christians, and it was his belief that a most complete victory brought that fortress again into the possession of the Hungarians. He was killed at the battle of Kistelek, near the city of Hunyad, after a short illness, fell a victim to the disease, 1856.

**Swann, John**, English physician, superintendent Johns Hopkins hospital since 1889, was born in Union City, Mich., 1843. He was graduated at the University of Michigan, 1865; A. M., 1866; A. M., 1871; LL.D., 1895. Was superintendent eastern Michigan asylum, Pontiac, 1876-90. Professor of medicine, Johns Hopkins University, 1890-1900. Editor *American Journal of Insanity* 1890-1900. Editor *Johns Hopkins Hospital Reports* since 1890. Author: *Hints to Hospital Visitors*, with Dr. John S. Billings; also editor, with same, *Hospital, Dispensary and Nursing*, etc.

**Swart, Jesse Lyman**, Methodist Episcopal clergyman, editor, was born in New York, 1843. He was graduated at Wesleyan University, Connecticut, 1865. Was pastor Methodist Episcopal churches, 1865-67. Editor of Sunday school literature and secretary of Sunday school association and tract society, 1868-1900. Author: *Outline Narrative*; *Studies in the Bible*; *Four Points*; *Our Church*; *Harbors of the Bible*, etc.

**Swart (Swart)**, John Fletcher, American clergyman and writer, was born in Massachusetts, 1811. He was educated at Dickinson college, and became a Methodist Episcopal clergyman. In 1871 he was president of the American Methodist conference, Madison, N. J., and from 1873 until 1880 was president of that institution. At Cincinnati in 1880 he was elected moderator of the General Conference of 1891 he was made chancellor of the American University at Washington. He died at Washington, 1904.

**Swart, Hns (Hns; Ger. hns)**, John, Bohemian religious reformer, was born at Hussinec, in Bohemia, about 1570. He studied at the University of Prague, was appointed dean of the philosophical faculty in 1601, and rector of the university, 1603. As a preacher he was popular, and by the students, while as confessor to Queen Sophia he obtained access to the court, and was acquainted with the writings of Wycliffe, which exercised a great influence over him. In 1612 he was elected to the office of rector of the university. In order to organize a crusade against indulgence, the ecclesiastical king of Naples, who was a papal legate, he was expelled from the city. He was boldly raised his voice against the whole procedure as sacrilegious, while Jerome of Prague was in the city, and the emperor, in a manner, both the bull and the venders of indulgences. An interdict against Hns in 1612 was the consequence. Hns, however, appealed from

the pope to a general council and to Christ, and wrote a book *On the Church*, in which he condemned the abuses of the papacy, and denied the unconditional infallibility of the pope. He was expelled from a 1614 he went to Constance to the general council, under a self-conduct from the emperor, but his opposition to the pope's policy was so strong that he was ordered to retreat, he was burned at the stake, 1615.

**Swainston** (*ahn-steen-don*), Harry Burns, American educator, president of the University of Michigan, since 1910, was born at Lebanon, N. H., 1847. He was graduated at the University of Michigan, A. B., 1871; LL.D., University of Wisconsin. He was professor of law, 1884-87; professor of law, Cornell University, 1887-90; professor of law, University of Michigan, 1897-98, and since 1900. He revised and annotated five volumes *Michigan Supreme Court Reports*, 1887-90; and edited *American edition of Williams on Real Property*, and contributes to legal periodicals.

**Swainston** (*ahn-steen-don*), Anne, religious enthusiast, was born about 1590, and emigrated from Lincolnshire, England, to Boston, Mass., 1634. Banished from the colony for heresy she and her friends now obtained from the chief of the Narragansett Indians to reside in Rhode Island, where they set up a community on the highly commendable principle that no one was to be accused of a crime until he had been proved guilty. She died in 1660, at the age of thirty; executed wood carvings and other decorations in relief for the picture gallery at Hospital-Island, London, 1851, and studied in Edinburgh and in Rome. Principal works: *King Robert Bruce*; *King John*; a colossal bronze statue in Edinburgh.

**Swainston, John**, Scotch sculptor, was born in Edinburgh, Scotland, 1832. He was apprenticed to a wood-carver in Edinburgh at the age of thirteen; executed wood carvings and other decorations in relief for the picture gallery at Hospital-Island, London, 1851, and studied in Edinburgh and in Rome. Principal works: *King Robert Bruce*; *King John*; a colossal bronze statue in Edinburgh.

**Swinton** (*ahn-steen*), Ulrich von, German reformer and humorist, was born in 1488. When he was twenty years of age he was placed in the monastery at Fuld; but, disliking this mode of life, he fled to Erfurt in 1506, where he associated with scholars and poets. In 1510 he became abbot of the archbishop of Mainz, to the diet of Augsburg, where Luther had his famous conference with Cardinal Cajetan. He was persecuted by his enemies, and evaded himself of the protection of Franz von Sickingen, but was captured by the emperor's troops, and compelled to adopt a wandering life, and died in 1532 in the lake of Ufenau, in the lake of Zurich.

**Swinton, Thomas**, English geologist, professor of Greek since 1887, and principal since 1901, University College, Toronto, was born in England, 1825. He was educated at Magdalen College school and Worcester College, Oxford; M. A., 1847; LL.D., Toronto, 1890. He was professor of classics in the University College, Oxford, 1879-86; lecturer on marine and ancient history at Firth College, Sheffield, 1880, and professor of classics in the University College, Toronto, 1880. He is the author of *Swinton and various articles*, and is a popular lecturer on the classics and on Oxford.

**Swinyer** (*ahn-ster*), Thomas Henry, noted English biologist and comparative anatomy, was born in England, 1825. He was graduated at London University, 1845. Imbued with a passion for natural history, Swinyer devoted himself with zeal and intelligence to the study of numerous marine animals collected from time to time and from various sources. He published in 1851 papers on other branches of the same subject were printed in the *Philosophical Transactions of the Royal Society*. In 1854 he was appointed professor of natural history in the royal natural history museum, and in 1856 that institution he delivered courses to working-men with beneficial results. In 1874 he was made a member of the Royal Society. He was Rede lecturer at Cambridge in 1883, and president of the royal society, 1883-85. Among his many papers on subjects to which he was devoted are: *Oceanic Hydrozoa*; *Evidence as to Men's Place in Nature*; *Phylogeny*; *Science and Culture*; *Evolution*, etc. He died in Eastbourne, England, 1895.

**Swinyer** (*ahn-ster*), Dutch (ah-steen), or Huygens, Christian, was born at The Hague in 1629. He improved the telescope, and derived new methods for grinding and polishing the lenses. He was the inventor of the first pendulum clock; defined the rings of Saturn; and developed the wave theory of light. He was made a knight of the order of the Lion of Friesland at the invitation of Louis XIV. lived for a number of years in Paris where he produced many of his scientific papers.

**Swinyer, William De Witt**, American educator and writer, president of Bowdoin College since 1885, was born in New Brunswick, N. J., 1829. He was graduated at Harvard, 1879; D. D., Harvard; LL.D., Syracuse. Author: *Practical Ethics*; *Social Theology*; *Practical Idealism*; *The Evolution of*

the evolution of the human mind, etc.

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but also of the reality of the highest virtues that lay beyond the appearance of things. In 1819, **Jacobi, Karl Gotthard Jakob**, celebrated German mathematician, was born in Prussia, 1804. In 1831 he became a professor of philosophy and published his celebrated work, *Fundamenta arithmeticae Functionum Ellipticarum*, for which he received the great mathematical prize of the Sciences of Paris. He also wrote a great number of memoirs on the different branches of the higher mathematics, chiefly on *Sechs* and *Sechsen*, *gratia*, and was a regular contributor to the celebrated *Journal für reine und angewandte Mathematik* of Berlin. Died, 1859.

**Jacotot (aka 82/67), Jean Joseph**, inventor of the universal method of education, was born at Dijon, France, 1770. The principle of his system is that the mental capacities of all men are equal; the unequal results of education depend almost exclusively upon will, and he is able to educate himself, provided he is once started in the right way; knowledge should first be acquired through instinctive experience, or by the memory. He expounded his views in *Enseignement Universel*, 1820.

**Jacquot (aka 82/67), Joseph Marie**, French inventor, was born at Lyons, 1752. He attempted to establish a manufactory for weaving figured fabrics, planned several ingenious improvements in machinery, and brought to perfection the apparatus for figured weaving, which now perpetuates his name—the Jacquard loom. He remained at Lyons for many years, encountering much opposition from a prejudice against artificial machinery, but eventually triumphed. He lived the last years in tranquil retirement, and died in 1834. During his life he received the cross of the Legion of Honor, and in 1840 was named senator for his memory at Lyons.

**Jahn (aka 82/67), Ludwig**, the "Turnvater" or father of gymnastics, was born at Lüne in Prussia, 1778. In 1811 he started the first gymnasium in Berlin, and his system, meant to revive patriotism, attracted the French. But the gymnastics began to witness political stirrings, too liberal to please the Prussian government, and they were closed. He left the country, he had taken a prominent part in the movement, was arrested in 1819 and suffered five years' imprisonment. He was elected a member of the national assembly in 1848. Died, 1852.

**John, Otto**, German philologist, archaeologist and historical editor, was born at Leipzig, 1815. He lectured at Kiel, Griefswald and Leipzig. He deprived of his chair in 1851 for his part in the nationalist movement of the 1840s. He was in 1855 professor of archaeology at Bonn. He published works on Greek art, representations of ancient life on Egyptian monuments, and Greek classics, besides a *Life of Mozart*, and a number of masterly essays on music. Died, 1869.

**John, L. of England VII. of Scotland**, son of Mary, queen of Scots, and Henry, Lord Darnley, was born in Edinburgh, 1566. When his mother was forced to flee to England, he was proclaimed king of Scotland, 1567. In 1578 the earl of Morton, then regent, was driven from power, and James assumed full control. In the winter of 1589 James went to Denmark, where he married Princess Anne, daughter of Frederick II., king of that country. By the death of her father in 1603, James succeeded to the throne of England. He soon became unpopular with his new subjects. He really got on with his favorites, Kerr and Buckingham, both of them unpopular; and England's prestige as a power, which had been raised under Elizabeth, soon disappeared. The so-called King James Bible was completed during his reign. He was banished as a tyrant in 1617, and fled to France, where he read scholar, who wrote, disputed and harangued, and a nervous, driving little who acted. Died, 1625.

**James II. of England and VII. of Scotland**, son of Charles I. and Henrietta Maria, was born in 1603. In 1648, during the civil war, he made his escape to France. He then entered the military service of Spain. At the restoration he was made a high admiral of England, and in 1670 Charles II., 1685, James succeeded to the crown without opposition. On becoming king he promised to maintain the church and to respect the liberties of the people, but his government, nevertheless, was arbitrary and tyrannical; he persecuted the Catholics, and his policy was to subordinate English interests to French, permitted the "bloody assize," suspended the test and violated the rights of the dissenting churches, church officers to Roman Catholics, and by these and many other acts of despotism made his position necessary. He was deposed by William of Orange to assume the throne, and James fled to France; an invasion of Ireland in 1689 resulted in his defeat at the battle of the Boyne. He retired again to France, and lived at St. Germain until his death, 1701.

**James IV. of Scotland**, son of James III. and Margaret of Denmark, was born in 1473. His rule gave promise of being both vigorous and popular, but the personal ambition he possessed to rule as an open frankness won the hatred of his people. In 1503 the king married Margaret, eldest daughter

of Henry VI. of England, an alliance which led to the union of the two crowns just twenty years later. Henry VIII. came to the English throne in 1509, and in the disputes which followed, James, the eldest English king, was killed. He was met by the earl of Surrey, and in the battle which took place at Flodden, 1513, the king and many of his nobles were killed. James was twenty years old, and had reigned twenty years.

**James, Edmund James**, American educator, was born at University of Illinois, 1861. He was educated at the Illinois state normal school and at Northwestern and Harvard Universities; Ph. D., 1887. He was professor of public administration, and director of extension division of the University of Chicago, 1906-1901; president of Northwestern University, 1902-04; and president of the University of Illinois since 1904. Author: *Relation of the Modern Municipalities to the Gas Supply*; *The Legal Tender Decisions*; *Commerce of Chicago*; *Growth of Great Cities in Area and Population*; *Governments of a Typical German City—Halle*; etc.

**James, Payne**, Rainerford, English historical novelist, was born in London, 1801. He was educated at Putney and in France, and by exception wrote some Eastern tales, and was found favor with Washington Irving. In all he published seventy-seven works, historical romances mostly, but also biographies, poems, etc. Died, 1860.

**James, Henry**, American author, was born in New York, 1822. He was educated at Princeton, Switzerland, and at Harvard law school. He began his literary career as contributor to periodicals, and in 1859 published his first novel, *Author's Confession*; *Diary of a Man of Fifty*; *Washington Square*; *The Portrait of a Lady*; *Seigneur of the World*; *Flaubert's Story*; *The Little Totee in France*; *The Author of Biographies*; *The Bontemps*; *The Lesson of Bolinas*; *American* etc.

**James, William**, eminent American psychologist and philosophical writer, was born in New York, 1809. He was educated in private schools and by tutors, and at Lawrence scientific school, 1831-33; M. D. Harvard medical school, 1837; Ph. D., 1839. He was elected a member of the American Academy of Sciences, 1868. He was professor of psychology, 1880-91, and professor of philosophy, 1891-1902. He was elected a member of the British Academy, 1891. He was Gifford lecturer on natural religion, University of Edinburgh, 1890-1901. Corresponding member of the French Academy of Sciences, 1891. Prussian academy of sciences; member National Academy of Sciences, etc. Author: *Principles of Psychology*, 1890; *The Principles of Psychology*, 1890; *Other Essays in Popular Philosophy*; *Human Immortality*; *Two Supposed Objections to the Doctrine of the Immortality of the Soul*; *Doctrines of a New Name for some Old Hopes of Man*, etc. Died, 1910.

**James, Mary**, wife of John, (Anna Browne Murphy) British writer, was born in Dublin, 1794. She was the daughter of an artist, and many of her books are about pictures, painters, and other art matters. In 1823 she married Robert Jameson, and went with him to Canada, where he held government office. Among her books are: *Memoirs of Celebrated Female Sovereigns*; *Characteristics of Women*; *Memoirs of Italian Painters*; *The History of Sacred and Legendary Art*; and *Lovers of the Madonna*. She died in London, 1850.

**Jameson, John Franklin**, American educator, historian, was born in Boston, 1859. He graduated at Amherst College, 1879; Ph. D., Johns Hopkins, 1882; LL. D., 1902. He was head of department of history, University of Chicago, 1901-08, and director department of history, University of California, 1908-1910. Since 1905, he has been managing editor of *American Historical Review*, 1905-1901 and since 1905; *Author: William Usellin, Founder of the American Historical Review*. He edited the *Correspondence of John Jay*, and has been editor of the historical publications of the American historical association.

**Jameson, Leander Starr**, South African politician, was born at Edinburgh, 1853. He studied medicine at Edinburgh, and began practice at Kimberley in 1878. Through oil resources he engaged in pioneer work, and was in 1891 made administrator of the South African company at Fort Salisbury. He won enormous popularity during the troubles at Johannesburg between the Uitlanders and the Boers, and was elected, with by force of Rhodesia at Mafeking on the border frontier, and in 1895, in the Transvaal, to support the Uitlanders. At Krugersdorp they were overpowered by an overwhelming force of Boers, and Jameson and his forces were compelled after a short battle to surrender, January 2, 1896. Handed over to the British authorities, he was in custody for some time in London to fifteen months imprisonment, but was released in December. In 1900 he was elected member of the House of Commons, and from 1904 to 1908, premier of Cape Colony.

**Janet (aka 82/67), Paul**, French philosopher, was

born in Paris, 1823. In 1864, he became professor of the history of philosophy, at the Sorbonne, and a member of the Academy of Moral and Political Sciences. Among his works are: *History of French Philosophy*; *History of French Modernity*, etc. He was an officer of the legion of honor. Died in Paris, 1890.

**Janeway (aka 82/67), Daniel**, Dutch American physician, was born in New Jersey, 1841. He was graduated at Rutgers College, 1860; was graduated at the University of Pennsylvania, 1864; New York, 1864; LL. D. Since 1864 he has been in practice in New York, and has been president of the College of Physicians of New York College since 1868, first as curator, then in 1873 as professor of pathological anatomy, and now president of the college.

**James (aka 82/67), D. (aka 82/67), Cornelius**, sometimes called Janesius, bishop of Ypres, in the Netherlands, and founder of the Janesians. He was born at Acoqui, near Leerdam in Holland, 1566. In 1638 he was made bishop of Ypres. He died in 1638, just as he had become his great work, the *Augustinus*, in 3 vols., which sought to prove that the teaching of St. Augustine against the religious and semi-Pelagians on grace, free-will, and predestination was directly opposed to the teaching of the Jesuit schools. On the publication of his studies in 1640, he was received with loud clamor, especially by the Jesuits, and was prohibited by a decree of the Inquisition in 1641, in the following words: "Prohibited by Urban VIII. in the bull *In Eminenti*."

**Jastrow (aka 82/67), Joseph**, American educator, was born at Warsaw, Poland, 1863. He was graduated at the University of Pennsylvania, 1889. He was a member of the *Time-Relations of Mental Phenomena*; *Epitomes of Time Science*, part author; *Past and Future in Time*, etc.

**Jastrow, Morris, Jr.**, American orientalist, professor of Semitic languages, and librarian, University of Pennsylvania, 1881. He was graduated at the University of Pennsylvania, 1881; Ph. D., University of Leipzig, 1884. He was a member of the universities of Germany and France. He is a recognized authority on Semitic religions, languages, and literature. Author: *Religion and Philosophy in Assyria and Assyria*; *Author: Jewish Encyclopedia*; *Encyclopedia Britannica*; *Handbook of the History of the Jewish People*; *Dictionary of the History of the Jewish People*; and various other technical publications.

**Jay, John**, American statesman and jurist, was born at New York, 1745. He was admitted to the bar in 1768. In 1774, as a member of the first continental congress, he formed one of the committee of three that framed the celebrated address to the people of Great Britain, and in 1775, in framing the constitution of the new state, he was one of the chief-justice of New York, and in the following year he was elected chief-justice of the state. He took part in negotiating the treaty of peace entered into at Paris, 1783, between Great Britain and the United States. He was secretary of foreign affairs and in 1790 chief-justice of the United States supreme court. In 1794 he proceeded on a special mission to England, where he concluded a treaty which met with violent opposition from the anti-federalist party. He afterward held the governorship of New York state, and after refusing a second nomination to the chief-justice, died, 1829.

**Jobb, Sir Richard Cavendish**, British Greek scholar, was born at Dundee, Scotland, 1841. He was graduated from Trinity College, Cambridge, in 1862, and was elected fellow. In 1869 he became public orator of the University, in 1875 professor of Greek at Glasgow, and in 1881 he was elected member of parliament for Cambridge University. His books include: *The History of the Greek Language*; *Orator*; *Fraser of Greek Literature*; and his *Bacchylides*. But his greatest work is his translation of the *Works of Pindar*.

**Jeejeebhoy (aka 82/67), Sir Jamsetjee**, Hindu philanthropist, was born at Bombay, India, 1783. He was a member of the Legislative Council, and a Bombay merchant, in 1800. By 1823 he had amassed 2,000,000 pounds, and began to exhibit a magnificent liberality. He expended generously to various educational and philanthropic institutions in Bombay, and spent upward of a quarter of a million pounds in benevolence. Queen Victoria knighted him in 1842, and in 1857 he was made a baronet. Died, 1859.

**Jersey, Charles**, American Congregational clergyman, was born at Cambridge, 1801. He was graduated at Ohio Wesleyan University, 1821; a school of theology, Union University, 1823; D. D., Oberlin, 1849. He was ordained in 1827. He was ordained to the Congregational ministry, 1827, and was pastor of Broadway tabernacle, New York, author: *Our Heavenly Father*; *Barnet People in My Study*; *The Minister as a Preacher*; *The Minister as a Pastor*; *The True: The Old Year and the New; The New Crusade*, etc.

**Jersey, Joseph**, American actor, was born at Philadelphia, Pa., 1829. He came from a family of actors, and made his first appearance as a









**Johnston, Sir Harry Hamilton**, English traveler and writer, was born at Kennington, London, 1858. He was graduated at King's College, London, was a student at the royal academy of arts, and in 1882 accompanied a British expedition to explore Portuguese West Africa and River Congo, 1882-83; commanded a scientific expedition of the royal society to Mount Kilimanjaro, 1884; made a tour of the Congo basin, 1885-86; and a tour of the Nile valley, 1887-88, which led to the founding of the British Central Africa protectorate, 1890; commissioner and consul-general, 1891; consul-general of agency for the Nile valley, 1891-92; commissioner and commander-in-chief and consul-general for Uganda protectorate, etc., 1899-1901. Author: *Essays on the Tatarian Question; The Uganda Protectorate; British Central Africa; The Nile Valley; The Congo; Grenfell and the Congo*, etc.

**Johnston, Joseph Eggleston**, American soldier, was born in Virginia, 1807. He was graduated at West Point, 1829; served in the Mexican war, 1846-47; and was commissioned quartermaster-general of the United States army, 1860. He joined the confederate army as a brigadier-general at the outbreak of the civil war, served with distinction throughout that conflict, and in 1865 was commander of the army of the Trans-Mississippi. He published a volume of memoirs, chiefly military, in 1874. Died, 1891.

In 1879, Joseph W. Foster, lawyer, United States senator, was born in North Carolina, 1843. He left school to join the confederate army as a private in 1861; served during the war, was wounded four times, and rose to the rank of captain. After the war he was admitted to the bar; practiced law seventeen years; was a banker ten years; and was elected governor of Alabama in 1890, reelected in 1894, serving two terms. He was unanimously elected to the United States senate from Alabama to fill out the unexpired portion of the term of Hon. E. W. Pettus, deceased, ending 1909, also for the term 1909-15.

**Johnston, Mary**, American novelist, was born at Buchanan, Botetourt county, Va., 1870, daughter of John William Johnston. She was educated at home, and exhibited literary talent at an early age. Author: *Prisoners of Hope; To Have and To Hold; Audrey; Sir Mortimer; The Goddess of Romance*.

**Jainville** (shawn'vil'), Jean, *Sire de*, French historical writer, was born in 1224, and became seneschal to the count of Champagne and king of Navarre. When almost eighty he undertook his delightful *Vie de Saint Louis*. His style conforms closely to his character; it is veracious, flowing, naive, often singularly expressive. Died, 1317.

**30kal** (yó'ko), Maurice, Hungarian novelist, was born at Komorn, Hungary, 1825. He published his first book in 1845, and took part as a journalist in the revolution of 1848. In 1863 he entered the Hungarian parliament, and during his long career there was one of the principal supporters of Koloeman Tisza, 1875-90. He wrote about 200 novels. Died, 1904.

**Joliet** (Fr. *Joliet*; Eng. *Joliet*), **Louis**, French-Canadian explorer, one of the early explorers of the Mississippi, was born at Quebec, 1645. He was sent to France to be educated, and returned to Quebec. With Marquette he was selected to explore the western country and to push through to the mouth of the Mississippi. They started on their journey in June, 1673, and after a long and arduous journey, they reached the Mississippi at the mouth of the Wisconsin in June. They floated down the Mississippi, passing the mouth of the Illinois, and then the Ohio, far enough to be sure that the river flowed into the gulf of Mexico. Joliet upset his canoe on his way back, losing all his maps and papers. He returned to Quebec, and his expedition was Marquette's. A few men have contributed more to the geography of that time than

**Joly de Lotbinière, Sir Henry Gustave**, Canadian statesman, b. 1829. He was educated at the Sorbonne, Paris, France, and admitted to the bar of Quebec, 1855; queen's counsel, 1878; premier of Quebec, 1878-79; leader of opposition, 1883-85; vice-chairman, Dominion liberal convention, 1883; minister of inland revenue for Dominion of Canada, 1896-1900; and lieutenant-governor of British Columbia, 1900-08. He has always taken an active interest in forestry, and was vice-president of the Canadian forestry congress, 1885. He has published various writings on forestry and on the metric system.

**Joachim (Johann) de Heer**, Baron, noted Swiss noble and military writer, was born at Fayerswil, Switzerland, 1779. When very young he entered the Swiss guard of Louis XVI., but when it was disbanded returned to his own home, and before he was twenty years of age was one of the first to participate in the French revolution. He was invited by Napoleon to join the campaign against Russia, and was appointed historian of the grand army. When the cause of Napoleon was almost lost he became an ardent supporter of the emperor, and fought for the allies. Napoleon bore him no ill-will for this course, saying, "He was not a Frenchman, and there was no love of country to retain him." He is known now chiefly by his works on military history and the art of war. He died at Passy, near Paris, 1859.

**Jones, Henry Arthur**, English dramatic author, was born at Grandborough, England, 1851. He was educated at Winslow, Bucks; hon. M. A. from (40)

**B Harvard University, 1907.** Author: *A Clerical Error; The Rogue's Comedy; The Physician; The Lovers; The Manufactures of Jane; Carmine Sabel; The Last Days of Pompeii; The Two Kings; The Princess's Nose; The Idol; Waterwreath; Juiva; The Great Magician; The Jew; The Jew's Daughter; The Hypocrite; The Economist; The Successes of the English Drama; comets, leavertus, etc., etc.*

From 1867 to 1873, at Venice his attention was drawn to the works of Palladio, which awoke in him a desire to erect archaic buildings. His style was thereforwarder wholly directed. Having been appointed first architect to Christian IV., of Denmark, he began to build in Copenhagen. In Copenhagen, James attended him, remained there, and became architect to the queen. In 1620 he was sent to Rome by Christian IV. to study the architecture of St. Paul's cathedral, and in the following reign he ordered the banqueting-house at Whitehall, London, after the model of St. Paul's.

**John, Jenkin Lloyd**, independent minister, editor, and lecturer, was born at Cardiganhire, South Wales, 1813. He served as a private in the 6th Wisconsin hattery for three years in the civil war; was graduated from Meadville, Pa., theological seminary, 1870; nine years pastor of a Baptist church, Greenville, Wis.; secretary of western Unitarian conference for nine years; organized and was first secretary of western Unitarian Sunday-school society; in 1878, with others, established *Unity*, a weekly paper, now organ of the congress of religions, and has been its editor since 1879; in 1883 he was elected pastor of All Souls church, Chicago.

**Jones, John Paul**, American naval commander, was born at Arbikland, in Scotland, 1747. His original name was John Paul. He settled in Virginia, assuming the name of Jones. When the congress, in 1776, resolved to fit out a naval force, he offered his services; and, visiting the British coast in a brig of eighteen guns, performed some remarkably bold exploits, and took advantage of

remains bold, exploits, and took advantage of the British weakness to make a hostile visit to the shores of the Solway Firth. In 1770 he was appointed to the command of a small squadron of French ships displaying the American flag. He sailed again against the British, causing great alarm and taking some prizes. Off Flamborough he fell in with a fleet of forty-one British merchantmen, convoyed by a fleet of four frigates. He captured the *Cousins*, *Serapole*, *Bomborough*. Jones lashed his *Ben Hanne* *Richard* to the *Serapole* and after three hours of desperate fighting compelled her surrender. He took his own ship and the *Serapole* transferred his crew to the *Serapole*. In 1787 he accepted an appointment in the Russian service, and the command of a fleet at the mouth of the Danube, in which he was to take part in the Turkish war. He died Paris, 1792.

The Turkish War. He died at Park, 1795.

**Rees, Samuel Golden.** American political reformer, and one of the founders of the American Society of Unitarianism. He was a persistent advocate of that practice in politics and in business, was born in Wales, 1846. Brought to America in 1849, he worked as a boy in the oil fields. He established large manufacturing plants at Toledo, Ohio, and gained an immense fortune and a splendid reputation in business. Elected as a republican member of Toledo in 1897, he was re-elected on an independent ticket in 1899, 1901, and 1903, using his office to defeat graft and dishonesty and to secure the rights of the common citizen; Died, 1904.

son, Wesley L. Sawyer, United States senator, was born near Bethany, Ill. 1863. He was a lawyer in Chicago, and moved to the territory of Washington just before its admission as a state. He began law practice, 1880. He took part as speaker in Blaine campaign, 1884, and Harrison campaign, 1888. He was elected to congress from Washington. He was member of congress from the state-at-large, 1899-1906, and was elected to congress, 1907-1909. He was elected to congress, 1911-1913. He was elected to congress, 1915-1917. In 1774 he was called to the bar, and in 1776 became commissioner of bankrupts. In 1778 he was appointed judge of the supreme court of judicature in Bengal, and was knighted. He at once devoted himself to Sanskrit, whose study he continued until his death. He was the first to print one in 1787. He established the Asiatic society of Bengal in 1784, and was its first president. A monument to his memory, erected by the East India company, stands in Calcutta.

India company, in St. Paul's cathedral.  
**Jonson, Benjamin, or Ben**, English dramatist, was born at Westminster, about 1573, and was educated at Westminster school. The first piece that he wrote was a comedy, called *Every Man in his Humour*, published in 1598. The best of his subsequent productions are *Volpone*, or *the Fox*, *The Silent Woman*, and *The Alchemist*. He also composed two tragedies, *Sejanus* and *Catharine's Conspiracy*. His *Masques*, written for the courts of James and Charles, are very graceful. Jonson died in 1637, in the thirty-ninth year of his age. His misfortune in these monarchies, and his imprudence involved him in difficulties, and he died in poverty, 1637.

**Jordaens** (yôr'dâns), **Jakob**, Flemish painter, was born at Antwerp, 1593. He ranks next to Rubens

among Flemish painters, and was master in the guild of St. Luke. He excelled in humorous scenes of Flemish life, also painted scriptural and mythological subjects. Among his numerous works are: *Jesus in the Midst of the Doctors*; *The Adoration of the Shepherds*; *The Satyr and the Man*; *St. Michael and Satan*. D. 1679.

who *Blow Hot and Cold*, etc. Died, 1878.  
**John W. Dard** 1839, American naturalist and ornithologist, president of the New York Jr. University, was born at Gaioville, N. Y., 1851. He was graduated at Cornell University, M. R., 1873; Ph. D., 1875. He was professor of Zoology at Cornell University, 1878; LL. D., Cornell, 1884; Johns Hopkins, 1902; president of Leland Stanford Junior University, 1903-1904; and State commissioner in charge of fur seal investigations, etc. Author: *A Manual of Vertebrate Animals of Northern United States*; *Standard God* (1884); *Standard Fishes of the United States*; *The Blood of the Nation*; *Food and Game Fishes of North America*, with B. W. Evermann; *A Guide to the Study of the History of the Scholar*; *The Call of the Twentieth Century*.

Joseph, favorite son of Jacob by his wife Rachel, who excited the envy of his elder brothers and was by them sold into Egyptian slavery, was born in Haran and died in Egypt. He flourished about the nineteenth century B. C. Having acquired the mastery of Egypt, Joseph, through his successful interpretation of dreams, obtained a high position at the head of the arrangements for provisioning the kingdom during seven consecutive years of famine, and was thus enabled to preserve, in the persons of his father and brothers, with their families, the future Israelitish nation. His body was embalmed and taken up into Canaan by his brethren, and thence to Egypt.

**Joseph I.**, emperor of Germany, was born at Vienna, 1678, and was crowned king of Hungary in 1687. He then succeeded his father, Leopold I., as emperor of Germany in 1705. He granted privileges to the Protestants, and, in alliance with Britain, prosecuted successfully the war of the Spanish succession against France, under command of Prince Eugene and the duke of Marlborough. He died in 1711.

He died in 1711. The emperor of Germany, son of Francis I and Maria Theresa, was born in 1741. In 1764 he was elected king of the Romans, and after his father's death, in 1765, emperor of Germany. As emperor, he was the last ruler of the Holy Roman Empire. He was the first ruler of the Austrian government of Austria he declared himself independent of the pope, and prohibited the publication of any new papal bulls without his placet. He was the first ruler to abolish the sale of the regular clergy from \$3,000 to 27,000, prohibited papal dispensations as to marriage, and in 1781 published the edict of toleration for the Jews. He was the first ruler to abolish serfdom, reorganised taxation, and curtailed the feudal privileges of the nobles. In 1788 he engaged in an unsuccessful war with Turkey; and the same year he was forced to give up his claims in his dominions, hastening his death, 1790.

**Josephine, Marie Josephine** *Teacher de la Pagerie*, first empress of the French, was born in Martinique, 1763. She married first the Vicomte de Beauharnais, and after his death, in 1796, Eugene Beauharnais, and Hortense, mother of Napoleon III. Her husband perished during the Reign of Terror, and she fled to England in 1794. In 1804 she married Napoleon, then Emperor Bonaparte, the newly-appointed master and chief of the army of Italy. Sharing her husband's fortunes, she became in time the occupant of the throne of France. She was noted for her beauty, grace, and womanly virtues. Failing, however, to afford an heir to the monarchy, she was obliged to abdicate in 1815, and she was consummated in 1839. Josephine, thereupon retired to her chateau at Malmaison, Dec. 1814.

**Josephus** (Jōs'fus), **Flavius**, celebrated Jewish historian, was born at Jerusalem, 37 A. D. As a dependent of the Flavian family, he assumed his name of Flavius. His *Antiquities of the Jews*, in twenty books, gives an account of Jewish history from the creation of the world to 66 A. D. A remarkable passage in this work relating to Jesus Christ is now believed to be spurious. His other works are: *History of the Jewish War*, and an *Autobiography*. He died about 100 A. D.

an *Autobiography*. He died about 100 A. D. Joshua (*Josh 6-8*), celebrated Hebrew warrior and leader of the Israelites, who was defeated and conquered, was the son of Nun, of the tribe of Ephraim, and was born in Egypt. The so-called book of *Joshua*, in its present form, containing an account of the conquest and division of the "land of promise," is of composite structure. The compiler made copious use, especially in the earlier chapters, of documents drawn up during the period of the conquest. He died about 1225 B. C.

**Jehoiachin** (*Jo-a'-o*), king of Judah, succeeded his father Amon at eight years of age, and flourished about 609-608 B. C. He reestablished the worship of Jehovah, and instituted the rites in the newly-discovered "book of the law." He fell at Babel attempting to check Pharaoh-Necho's advance

**Hubert** (you'berf), **Petrus Jacobus**, Boer general and statesman, was born in Cape Colony, 1831. He was a farmer and ranchman; became a member of the Volksraad; was attorney-general in 1870; and in 1874 was acting-president. He was one of the triumvirate who organised a Transvaal



of the new museum at Berlin with a cycle illustrating the progress of civilization. His last graphic painting was the *Sea-Fight of Salamis* at Berlin, 1874.

**Kaunitz (kō-ni't), Wenzel Anton, Prince von**, Austrian statesman, born at Vienna, 1711. He distinguished himself in 1748 at the congress of Aix-la-Chapelle, and as Austrian ambassador at the French court in 1750. He was friendly to the French, and in 1753 he was appointed chancellor, and for almost forty years had the principal direction of Austrian policy. He took an active part in the liberal reforms of Joseph II., and was a liberal patron of arts and letters. Died, 1794.

**Kean, Charles John**, British actor, was born in Waterford, Ireland, 1811, son of Edmund Kean, who was educated at Eton and acted as actor at Drury Lane, 1827, but did not establish his reputation until 1838, when he acted as Hamlet, Richard III., and Sir Giles Overdone. In 1842 he married Miss Ellen Tree, a celebrated actress. His last appearance was as Louis XI. at Liverpool in 1867. Died, 1868.

**Kean, Edmund**, English actor, was born in London, 1767, son of Nance Carey, a strolling actress. A stage cupid and a cabin-boy to Madeira, he himself about sixteen turned a "stroller," and after ten years in the provinces made his first appearance at Drury Lane in 1792. He was at Drury Lane for the first time on the day of the period of wonderful success followed. He was finally received as a permanent member of the company, but both mind and body gave way, and, breaking down hopelessly in 1835, he died at Richmond in 1839.

**Kean, Augustus Henry**, British ethnologist and geographer, meritorious professor of Hindustani, at University College, London, and of Dublin, Ireland, 1833. He was educated in Jersey, Italy, Dublin, and Hanover, Germany, and traveled extensively in Europe and Asia. Author and editor of: *Stanford's Asia, Africa, Central and South America*; *Ethnology*; *Physical Geography of the World*; *Gold of Ophir*; *The Boer States*; *The World's Peoples*.

**Kean, John Joseph**, American scholar and educator. Roman Catholic archbishop of Dubuque, Ia., since 1900, was born in Ballyshannon, Ireland, 1836. He came to the United States in 1846; was educated at St. Mary's seminary, Baltimore, Md. Ordained priest, 1866. Was active in organizing Roman Catholic societies, and in 1870 was elected to the University of America, at Washington, 1868-69, when he resigned and went to Rome. Upon his return to America he was elected to the chair of his present see. Author: *Onward and Upward*, etc.

**Keary (kē-ā'), General Philip**, American soldier, born in New York, 1793. He was attached to the staff of General Scott, 1841-44, and distinguished himself in the Mexican war. Commanded the cavalry of the United States in the peninsula campaign during the civil war, in which he won an enviable reputation for courage and gallantry. He took part in the collision at the second battle of Bull Run and also at Chancellery, Va., where he was killed in 1862 by a Confederate soldier while reconnoitering in front of his command.

**Kens, John**, English poet, was born in London, 1795. He was apprenticed to a surgeon at Edmonton, near London, and found time to cultivate that taste for poetry which he had inherited from his boyhood; in 1817 he published a volume of juvenile poems, having already made several contributions to the *London Examiner*, then under the editorship of Leigh Hunt. In 1818 appeared his *Endymion*, a poetic romance founded in part on the model of Fletcher's *Faithful Shepherdess*. This work, though the production of a youth of little more than three-and-twenty, was warmly criticized in the *Quarterly Review*, and in *Blackwood's Magazine*, the wrath of the reviewers being probably inspired by their hatred of the collateral party with which Kens had identified himself, and which was represented by Keat's friends, Hazlitt and Hunt. He professed, however, by the criticisms of his reviewers; and in 1820 published his *Essays of St. Asaph*; his odes to *The Nightingale* and *The Grecian Girl*; and *On Fragments of Hypocrite*, taken, like *Endymion*, from mythological sources, and written in an airy strain of classic poetry, characteristic of Keat's style, and quite as beautiful. But already consumption had taken hold of the poet; he went to Naples, from there to Rome, where he died, 1821.

**Keble (kē-bē'), John**, English clergyman and poet, was born in 1792. At the age of fifteen he entered Corpus Christi College, Oxford, where he won several prizes and otherwise distinguished himself. In 1827 he published his volume of sacred poetry entitled the *Christian Year*, which attained a very large circulation and an influence that can hardly be overestimated. He was one of the leading spirits in what was known as the "Tractarian movement" in the English church, and for several years was actively engaged with Pusey, Newman, and others in its efforts. He died at Bourne-mouth, 1866.

**Keen, William Williams**, American surgeon, was born in Philadelphia, Pa., in 1821. He was educated at Brown University, 1839; M. D., Jefferson Medical College, Philadelphia, 1862; L. D.,

Brown, 1891, Northwestern, Yale, 1906. He was assistant surgeon of 5th Massachusetts regiment, 1861; since 1866 he has been in practice as a Philadelphia. He was professor of anatomy at Pennsylvania academy of fine arts, 1879-90; and has been professor of surgery at Jefferson Medical College, since 1889. He is author of many medical and other bodies. Author: *Keen's Clinical Cases*; *History of the Philadelphia School of Anatomy*.

**Keifer (kē-fer), Joseph**, German congressman, co-speaker of United States congress, was born in Philadelphia, Pa., 1826. He was educated at Antioch College, Ohio, and since 1858 has practiced law at Springfield, Ohio. He served in the Ohio volunteers in the field, 1861-65; for Ohio G. A. R., 1866-70; member of congress, 1877-85, and several times speaker of the house. He was appointed in 1890, 1896-99, as major-general of volunteers in the war against Spain. Author: *Stones and Four Years of War*.

**Keith (kēth), George Keith-Elphinstone, Viscount**, British admiral, son of the tenth Lord Elphinstone, was born at Elphinstone Tower, Stirling, 1746. He commanded the expedition in 1790-97 which took Cape Town, and the fleet landed at Abercromby in the P. of the Bay. In 1801. He was made Baron Keith in 1797, and a vicount in 1814. Died, 1823.

**Keller (kē-lér), Hermann**, German author, was born at Tusculum, Ala., 1850, daughter of Captain Arthur H. Keller. She is descended on her father's side from a family of Swiss origin, and on her mother's side from a family of German origin. She was educated in Virginia, and through her mother related to Adams and Everett families of New England. She died of consumption in 1892, after a long illness of some months as result of illness. At the age of seven she was placed under the instruction of Alexander D. Bulfinch, who was her teacher, and the beginning of her education to the present time. She entered Radcliffe College, 1900, and graduated in 1904. She has published several occasional papers to *Century Magazine*; *Youth's Companion*; *Ladies Home Journal*; *McClure's Magazine*, and is the author of *The Story of My Life*; *Optimism*, an essay, etc.

**Kellerman (kē-lér-mān), François Christopher**, French soldier, born at Paris, 1776. He entered a regiment of French hussars at the early age of seventeen. When the revolution broke out he joined the army to the revolution. For his services in Italy, he was made duke of Valmy and marshal of the empire by Napoleon. He was killed at Waterloo, 1815, during the restoration, confirmed his title of duke, and also created him a peer of France. He died in 1820.

**Kelllogg, Clara Louise**, American prima donna, was born at Newburyport, N. C., 1844. She made her debut in opera, 1861-62, as *Giulia in Rigoletto* at the academy of music, New York; and from that time she has been steadily and successfully in the estimation of the public. She sang repeatedly in London, and once or twice before Queen Victoria, at the palace. She sang in London for several years and organized her own English opera company, and has appeared principally at concerts of late years. She married, 1867, Carl Strakosch, nephew of the well-known impresario, Max and Maurice Strakosch.

**Kelllogg, Frank R.**, American lawyer, was born at Potsdam, N. Y., 1856. He went to Minnesota with his parents in 1865; studied law, and was admitted to the bar. He returned to St. Paul in 1887. He was general counsel of the Chicago Great Western railway company, Duluth and Iron Range railroad company, Duluth, Mesabe and Northern railway company, Minneapolis Iron company, Oliver Iron mining company, etc.; special counsel for United States in the case against the paper and Standard oil trusts, and special counsel for interests commerce commission in the investigation of the Chicago and Northern railroad company.

**Kelly, Howard Atwood**, American physician, was born at Camden, N. J., 1858. He was graduated at the University of Pennsylvania, 1877; M. D., 1883; L. D., Aberdeen, 1908. Washington and Jefferson University of Pennsylvania, 1907; F. R. C. S., Edinburgh. He was founder of the Kensington hospital, Philadelphia; now professor of gynecology, Johns Hopkins University, and gynecological hospital, Johns Hopkins hospital. He is a member of many scientific and scientific societies, both foreign and American. Author: *Operative Gynecology*, 2 vols.; *The Vervum Appendix and its Diseases*, etc.

**Kelly, John Howard**, American sculptor, was born at New York, 1855. His studied art at the National Academy of design. His first piece of work was the *Shelby's Ride*, a statue of General Sherman, Sheridan, and Hancock, gave him sittings for a series of bronzes, *Memorials*, *Monuments*, *Monuments*, *Call to Arms*, *Troy*, N. Y.; equestrian figures of General Sherman, Colonel Roosevelt at San Juan and General Sherman at the battle of Gettysburg, and C. E. Clark, and President Roosevelt as colonel of the Rough Riders; panels from life of the American statesman, Samuel Jackson, and one of the founders of the art students' league.

**Kevin, William Thomson, Lord**, was born at Belfast in 1824. After graduating at

Cambridge, he was appointed, 1846, to the chair of natural philosophy in Glasgow University, a post he retained till 1869.

His research work includes all branches of mathematical physics, and particularly heat, his principal work has been in extending thermodynamical principles—notably in devising a method of arriving at an absolute scale of temperature, and in discovering the "Joule-Thomson effect," and in enunciating the principle of the dissipation of energy. In general physics, he has done much to apply mathematical methods of expressing the relations of observed facts, and he has worked out most fertile ideas as to the nature of the ether, of inertia, and the application of vortex motion to explain the properties of atoms.

His principal work, however, is probably in the field of electricity and magnetism, the first fruit of which appeared in the paper he published in 1846 on the laws of electrostatics, and which was greatly developed in his researches on electrostatics and submarine telegraphy. These theoretical investigations he applied to the Atlantic and other cables from 1858 to 1866, and in his invention of many instruments of the highest precision for the use both of the investigator and of the practical man.

Among the best of these appliances are the reflecting galvanometer, the siphon recorder, several forms of electrometer, the ampere balance, electrostatic voltmeter, and electric supply meters. He has also done much interesting work in navigation, and in this connection invented an improved form of mariner's compass and an invaluable sounding-machine, besides working out methods for compass correction, and for the investigation of tidal phenomena. In addition to three series of monographs—(1) *Electrostatics and Magnetism*, (2) *Mathematical and Physical Optics*, and (3) *Acoustics*—he has also published *Baltimore Lectures on Molecular Dynamics and Wave Theory of Light*, and, in collaboration with Professor P. G. Tait, *A Treatise on Natural Philosophy*. He was knighted in 1890.

**References.**—*Figuralist*: Lord Kelvin; S. P. Thomson's *Life of Lord Kelvin*.

**Kemble, John Philip**, English tragedian, was born at Brecknock, in South Wales, 1776. In 1794 he made his first appearance at Drury Lane, London. He is a descendant of the famous actor, who visited the United States in 1832. Appointed examiner of plays in 1865, he performed the duties of his office until 1880, when he relinquished the stage in 1840. Died, 1854.

**Kemble, Frances Anne**, English actress and Shakespearean reader, was born in London, 1809. She was the daughter of the celebrated Charles Kemble, and was commonly known by the name "Fanny." She made her debut at Covent Garden in 1829, and in 1832 came to the United States with her father, where she met with great success. In 1860 she left America, and from that time her residence was partly in England and partly in the United States. Died, 1894.

**Kemble, John Philip**, English tragedian, was born at Prescott, 1757. His first appearance was at Wolverhampton in 1776. The success of his acting in *Macbeth* and *Richard III.* was remarkable. He was married in 1780, and in 1783 he played Hamlet at Drury Lane, and around the nearest interest. In 1802 his reputation as a tragedian began to decline, and he became manager, and made his first appearance there in 1803 as Hamlet. He retired in 1817, and spent his last years at Lausanne, where he died, 1823.

**Kempke, Thomas A.**, German mystic and writer, so called from Kempen, a town in the Prussian Rhine province, where he was born about 1759. He was educated at Drenthe, and in 1400 entered an Augustinian convent in the diocese of Utrecht. He drew little place in 1817, at which time he certainly had attained his nineteenth year, and most probably his ninety-second. The character of Kempke for sanctity and holiness of the world very high among his contemporaries, but his historical reputation rests almost entirely on his writings, which include many sermons, treatises, pious biographies, letters, and hymns. Of these, however, the only one which deserves notice is the *Imitation of Christ*, a work that is certainly had attained his nineteenth year, and most probably his ninety-second. 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South Africa, 1899-1900; commander-in-chief, 1900-02; later was promoted lieutenant-general and general, and created Viscount.

**Kitchin, George William**, English historian, was born at Naughton rectory, Suffolk, 1827. He was educated at Ipswich, King's College, London, and Christ Church, Oxford. He became dean of Winchester in 1863, and of Durham in 1894. His chief work is his *History of France*.

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 Knight (Edg.) *John*, biblical writer, was born at  
 Plympton, Devon, England, in 1817. He became  
 stone-deaf through a fall, and learned shoe-making.  
 The rest of his life was spent in the service of  
 Charles Knight and other publishers. In 1850  
 he received a pension of 100 pounds. His works  
 include *The Pictorial Bible*; *Pictorial History of*  
 *Palestine*; *History of Palestine*; *The Lost Senses—*  
*Deafness and Blindness*. In 1884 the University  
 of Gießen made him a D. D. He died at Cann-

**Klaw, Mare**, theatrical manager, was born at Paducah, Ky., 1858. He was educated in the public and high schools of Louisville, Ky.; studied law and was admitted to the bar. Since 1881 he has been engaged as theatrical manager, and is now a member of the theatrical firm of Klaw and Erlanger of New York.

**Kilber** (Alm'dér), Jean Baptiste, French general was born at Strasbourg, 1700, and in 1776 obtained a commission in the Austrian army. In 1794 he was sent to the West Indies, and in 1795 to the Rhine district; in 1796 he gained the victory of Altenkirchen. He accompanied Bonaparte to Egypt, was wounded at Alexandria, and the latter left him in the hands of the Turks. Bonaparte left Egypt he entrusted the chief command to Kilber, who concluded a treaty with Sir Sidney Smith for its evacuation, but was afterwards obliged to sue for pardon. He refused to reconquer Egypt and destroyed the Turkish army at Heliopolis. In the course of an attempt to conclude a treaty with the British he was assassinated by a Turkish fanatic at Cairo, 1800.

**Klein (kline), Charles**, playwright, was born in London, England, 1867, and was educated at North London College. He was formerly censor of plays for Charles Frohman. Author: *A Mile Minute*; *El Capitan*; *Heartsease*; *The Hon. John Grigsby*; *Dr. Belgraff*; *A Royal Rogue*; *The Music Master*; *The Lion and the Mouse*.

**Klopstock** (*klop'shtok*). **Friedrich Gottlieb**, German poet, was born at Quedlinburg, 1724. Inspired by Virgil's *Aeneid* and Milton's *Paradise Lost*, he resolved to write a great epic, and as a student at Jena, in 1745, he began *The Messiah*. The last volumes of *The Messiah* were published in 1773. Regarded in his own time as a great religious poet, he helped to inaugurate the golden age of German literature. *The Messiah* was translated into both English verse and prose. Died, 1803.

**Kapp, Morris Augustine**, American lawyer and jurist, chief justice of the U.S. Court of Commerce was born in Stafford, N. Y., 1843. He was graduated from Wesleyan University, Connecticut, 1868; LL. D., 1892; hon. A. M., Syracuse University, 1892. He was laterate state commerce commissioner 1891-1910; chairman of the commission, 1896-1910, and appointed chief justice of the new U. S. Commerce Court, created 1910. For a number of years he lectured on mercantile law at the University of Wisconsin.

commerce law at George Washington University. Kneisel (k'ni'sel), **FRANZ**, German-American musician, director of Kneisel quartette, was born in Roumania, of German parentage, in 1868. He studied violin instruction under Grün and Hellmesberger; was concertmaster of Hofburg theater orchestra, Vienna; later of Bilse's orchestra, Berlin, and concertmaster of the Boston symphony orchestra. He is especially prominent as violin soloist. Since 1905 he has been head of violin department in the institute of musical art, New York.

**Kneiler** (w/3r). **Str Godfrey**, noted portrait painter, was born at Lobeck, 1646. He studied at Amsterdam and in Italy, went to London, 1675 and in 1680 was appointed court-painter. In 1693 William III, knighted him, and in 1711 George I. made him a baronet. His best-known works are the *Beauties of Hampton Court*, painted for William III.; his portraits of the Ku-Cut Club and of fourteen sovereigns. He died at Twickenham, 1722.

**Knight, Charles**, English publisher and author, was born at Windsor, 1791. He early turned his attention to publishing, and in 1823 he started the *Quarterly Magazine*, and continued it in some time in London. The whole of his notable worthy career was devoted to popular literature of which he was one of the earliest and most accomplished advocates. Among the works which he published or edited are the *Penny Magazine* which was started only a month or two after

**Knight, William Angus**, Scotch educator and writer, professor of mental philosophy, University of St. Andrews, 1876-1902, was born in Scotland, 1836. He was graduated from the University of Edinburgh; B.L.D., Glasgow. Author: *Science and Philosophy* (1869); *Psychology* (1870); *Logic* (1871); *Essays in Philosophy* (1872); *Old and New: Selections from Wordsworth; Coleridge and Wordsworth in the West Country, their Friends and Surroundings*, etc.

**Knowles, James Sheridan**, British dramatist, was born at Cork, 1794. His *Crime Graciosa* was first produced at Belfast. *Veronica*, his most successful play, had been a success in Glasgow before Maeredy in 1820 produced it at Covent Garden. Besides *William Tell*, in which Maeredy achieved one of his greatest triumphs, Knowles' other best plays are *Love, The Hunchback, The Love Chase*, and *The Wives*. He appeared with fair success in his own plays. He died in 1845 because of a Baptist preacher drew a large audience to Easter hall, and published two anti-Roman Catholic works. He died at Torquay, 1862.

**Major Henry**, American general, was born in Boston, Mass., 1750. He was an officer in a military company, and, when the revolution broke out, he escaped from the city with his wife, who hid his sword in the folds of her dress, and took part in the battle of Bunker Hill. He soon attracted the attention of Washington by his skill in planning fortifications and his knowledge of artillery, and throughout the war he commanded the artillery in various battles. Congress made him a major-general, and from 1785 to 1795 he was secretary of war. Died, 1806.

John, John, 1606, divine and reformer, was born at Giffordgate, in Haddingtonshire, 1613. He became a priest and a clergyman in the year of 1635. And he afterwards had a wife at the age of twenty-five. He renounced Catholicism about 1643, and then he was married to a woman named Mary. Mary, he retired to Frankfurt, and then to Geneva, where he became acquainted with Calvin. He was a man of great energy and courage, and he denounced the priesthood, and especially the mass and image-worship, and declaimed against the superstitions of the Roman Church. His tireless perseverance and vehement eloquence he labored until his death for the establishment of a reformed religion in Scotland. His influence was diminutive, and his frame wasted and feeble, but his energy was inexhaustible. He was the first of a series of reformers who were active in the Reformation of Religion in Scotland. But the influence he exerted was by the tongue rather than by the pen.

**Knox, Phileander Chase**, American lawyer and statesman, was born in Brownsville, Pa., 1853. He was graduated at Mt. Union College, Ohio, 1872; LL. D. at University of Pennsylvania, 1901; Y. B., 1907. He was admitted to the bar, 1875; was assistant United States district attorney, Western district of Pennsylvania, 1876-77. He was attorney-general of the United States, 1901-04; United States senator from Pennsylvania, 1904-09, and secretary of state since March A, 1909.

1904-05, and secretary of state since March 3, 1909.  
 Kobbe, 'Bob' J., a noted musical author and  
 journalist, was born in New York, 1854. He  
 graduated at Columbia University, 1877; Columbia  
 Law School, 1879. He engaged in newspaper and  
 magazine work, chiefly on musical and dramatic  
 subjects. Author: *The Ring of the Nibelung*;  
*Wagner's Life and Works*. 2 volumes: *Opera Singers*;  
*Signora, a Child of the Opera House*, a novel;  
*Wagner's Music Dramas Analyzed*; *Wagner and*  
*His Tools*; *How to Hear Wagner's Music*; *How to*  
*Understand Music*; *The Pianist*, etc.

Coen (Höx), Robert, German physician and bacteriologist, was born at Klausthal, in the Harz mountains, 1843. He studied medicine at Göttingen, and during his student life in 1865 made his first substantial achievement was the result of the penetration, skill, and thoroughness of his researches. In 1867 he discovered the bacillus of cholera. In 1870 he had begun his investigations into the cause of consumption, and in 1882 he announced the discovery of the tubercle bacillus. He was a member of the physiological society of Berlin. He discovered the comma bacillus, or cholera germ, in 1884. He was decorated with the Iron Cross by the German government, and Imperial titles and honors were showered upon him. In 1885 he was appointed professor in the University of Göttingen. His theories of hygiene being created for him, and was made director of the hygienic institute. In 1905 he was awarded the Nobel prize for achievements in bacteriology. Died 1910.

**Kohlsaat** (*Kol'sat*), **Herrmann Henry**, capitalist, journalist, was born in Alibon, Ill. 1853. He was educated in the common schools of Gale County, Mo. He was a traveling man for two other firms, and, 1875-80, for Blake, Shaw and company, wholesale bakers; became junior partner, 1880, and was in charge of the Chicago branch of the firm. He bought that branch of the business 1882, greatly enlarged it, and the firm of H. H. Kohlsaat & Co. was organized. He was devotedly and exclusively devoted to the wholesale bakery business. He was part owner of the *Chicago Inter Ocean*, 1891-93; was editor and publisher of *Chicago Record-Herald*, 1893-1901, and *Chicago Record*, 1894-1901. He retired from the *Record-Herald* 1902, and has been largely identified with local

**Komura (kōmōrō), Count Jutaro, Japanese** statesman, minister for foreign affairs since 1908. He was born at Hyuga, 1855. He was educated at the University of Tokyo, and at Harvard University Law School. Was *chargé d'affaires* in China, 1893-94; minister to United States, Russia, China, 1898-1901; minister for foreign affairs, 1901-06; senior plenipotentiary to the peace conference and signed, with Mr. Takahira, peace treaty at

Portsmouth, N. H., 1905; and Japanese ambassador to Great Britain, 1906-07.

**Kämpfer** (kämp'fer), **Theodor**, German lyricist, was born at Dravden, 1791. He studied at Freiburg, Leipzig, and Berlin, and in 1811 settled at Vienna. Here he was dramatist for a Vienna theater, and wrote some light comedies, among them *Der Grüne Domino* and *Der Nachschacker*, and some tragedies, of which *Zriny* was the most successful. His most famous song, *Das Schwert-Lied*, was dashed off in a verse battle only a few hours before the author fell at Gadebusch near Schwerin, 1813.

**Kosciusko** (Kos'cho'sko'), **Thaddeus**, Polish general and patriot, was born in Minsk, West Russia, 1746. He became a captain in the Polish army, and went to America to fight for American independence, and returned to Poland in 1786, with the rank of general. With 20,000 regular troops and 40,000 ill-armed peasants he resisted for months the undefeated Russian army of 150,000 men. Outpowered by superior numbers in the battle of Masejowice, 1794, he was captured and kept a prisoner until after the accession of the emperor Paul. When Napoleon, in 1806, formed a plan for the restoration of Poland, he encouraged himself restrained from taking an active part in it by his promise to the emperor Paul. He released from servitude, in 1817, the peasants on his own estate, and took place in 1831, in consequence of a fall from his horse.

Kossuth (Kósh'oor), Francis, son of Louis Kossuth, leader of the independence party in the Hungarian parliament, was born in 1841. He suffered exile with his father, was partly educated in England, and lived in France and Italy. After his father's death in 1894 he went back to Hungary, took the oath of allegiance as a Hungarian subject, and soon became leader of those aspiring to national independence. When the revolution came into office in 1906 he became minister of commerce in the Wéberik cabinet.

**Leószent, László**, Hungarian patriot, orator and leader, was born at Monok, 1802. In 1832 he commenced his political career as editor of a liberal paper. To the revolution of 1848 he was devoted not only the Hungarian revolution, but the insurrection in Vienna in 1848. To put an end to all the bloodshed he proposed the formation of a diet, which induced the national assembly at Debreczin, in 1849, to declare the independence of Hungary, and to elect Kossuth as its president and emperor of the throne. He was then appointed provisional governor of Hungary. In 1849 he was compelled to leave his position and to flee to the United States, where, however, he was made a prisoner. In 1851 he landed in the United States, where he met with the most enthusiastic reception. He returned in 1853 to England, and in 1854 he visited Italy, where the Italian war broke out against Austria, where he organised on Hungarian legion in Italy. Later he returned to Paris, where he died in 1867.

**Karl Ludwig August von Frederic Ferdinand von**, German dramatist and historic writer, was born at Weimar, 1761, and was educated at Jena and Duisburg. In 1801 he again left Russia when the French invaded the country, and spent the remainder of his life in innumerable literary productions, and in politics. The emperor Alexander subsequently employed him in various posts, and in 1817 he was appointed Russian correspondent in Germany. This invidious office, however, is said to have filled in a manner hostile to the freedom of his native country; and for this purpose he wrote a number of articles, and a few youthful satirical comedies and Sand. His dramas number nearly three hundred. Among his other works are: *History of the German Empire, History of Ancient Prussia*, and various narratives and recollections.

**Krehbiel** (*kré-bé*), **Henry E.**, musical critic, was born at Ann Arbor, Mich., 1854; studied law in Cincinnati, 1872-74; musical critic, Cincinnati *Gazette*, 1874-80; musical critic, New York *Tribune*, since 1880; chevalier of legion of honor, 1901. Author: *Studies in Wagnerian Drama; How to Listen to Music*, etc. Editor: *Annotated Bibliography of Fine Arts*.

**Kronkoff** (*kron's'koff*), **Joseph**, rabbi, lecturer, and author, was born in Ostrowo, Prussia, 1858. He came to America in 1872, worked as clerk at the Fall River, Mass. He was graduated at the University of Cincinnati, 1883, and as rabbi from Hebrew Union College, 1883; D. D., 1885. He founded the Jewish publication society of America; founded, and has been president since organization of the National farm school, in which Jewish boys are trained in practical and scientific agriculture. Author: *The Jews and Moslems in Spain*; *Evolution of the Jews*. *From the*

**Kropotkin** (kro-pót'kin), **Prince Peter**, Russian socialist, writer, was born at Moscow, 1842. In 1871 he explored the glacial deposits of Finland and Sweden; in 1872, while on a visit to Belgium and Switzerland, he associated himself with the extreme section of the International. In 1874, after returning to Russia, he was arrested, but in 1876 effected his escape to England. In France at Lyons he was condemned, in 1883, to five years' imprisonment for anarchism, but was released in 1886 and returned to England. Author: *Ja*



and pre-Darwinian evolutionist, was born at Raszewitz, 1744. In 1778 he published a *Fleur de France*. In 1779 he became a member of the French academy and keeper of the royal gardens. He studied the anatomy of plants and there he lectured for twenty-five years on invertebrate zoology. About 1801 he had begun to think about the subject of organic evolution. His conclusions in his famous *Philosophie Zoologique*, in 1809. His *Histoire des Animaux sans Vertèbres* appeared in 1815-22. He broke away from the old idea of species as fixed and unchangeable; of species, sought to explain their transformation and the evolution of the world, and proposed that the way the now accepted theory of descent. Died in 1829.

Lamarline (*de mdr'itrn*). Alphonse, French author, politician, was born at Mâcon, 1790. His work exerted a most important influence upon the republicans of France, and he is especially noted for his of the exercise into which they might otherwise have been led. The greater part of his career was devoted to the study and promotion of the political eminence. His *History of the Girondists*, published in 1847, undoubtedly did much to hasten the republicanism of France. His *History of the Girondists*, which appeared in the following year, is a deeply interesting account of a movement which, if it had not been turned into a revolution, would have been a most successful one. His *History of Louis Napoleon*, might have gained for France at once that free government which she gained only after the death of the Emperor.

Lamb, Charles, English essayist and poet, was born in London, 1775. He was the son of a clerk to one of the benches at the Inner Temple, and was educated at the same school. He was the schoolfellow and friend of Samuel Taylor Coleridge, and was employed by the latter as an accountant's office of the East India Company, retiring at last on a pension; but, during most of his life, he devoted himself, in a spirit of noble self-sacrifice, to the cause of his friend, who, like himself, inherited the instinct of immortality. His earliest literary efforts were in verse. In 1807 he published a volume of *Poems*, and in 1811 a series of *Tales from Shakespeare*; and in 1818 two volumes of *Specimens of English Dramatic Poets from the Elizabethan to the Eighteenth Century*. He wrote many short but felicitous notes. On the establishment of the *Quarterly Review*, in 1824, he contributed a series of essays, signed *Elia*, in which are the chief foundation of his fame. He died in 1834, his last words being "I am a poor fellow."

**Lander, Arnold Henry Savage**, English artist and traveler, was born at Florence, Italy, 1865, and was educated there and at Paris. He traveled in the East several years, also in America. As traveler he explored the sources of the Nile, and was the first white man to reach both sources of the great Brachnaputra river and establish their exact position; to do this was a geographical problem of some rank higher than the Himalayas and the north of the Brachnaputra river; He holds the world's record in mountaineering, having reached at least 22,000 feet in the Himalayas, and in 1899. Author: *Along with the Heavy Asau*, or 3,800 Miles on a Pack-saddle; *Corcor*, or The Land of the Living Dead; *Along the Mouth of the Euphrates*; *Nisroch*; *Across the Foothills of the Himalayas*.

**Landor, Walter Savage**, English poet and prose writer, was born at Ipsley Court, Warwickshire, 1775. He studied at Oxford where he won high reputation as a scholar, and in 1808 raised the literary standard by his *Imaginary Conversations*. He was a friend of the English patriots under Blake. He was made colonel in the service of Spain, but resigned his commission on the restoration of King Ferdinand. He first became known as the author of a poem, *Imaginary Conversations*, in 1808. In 1824-29 appeared his *Imaginary Conversations of Literary Men and Statesmen* in 5 vols. He was a thorough classical scholar and his Greek and Roman characters speak a language which should be understood by all who speak English. "He has," says Emerson, "an English appetite for action and heroes." Died in Florence, 1864.

**Landseer, Sir Edwin**, English painter, was born in London, 1802. The first work that brought him prominently before the public was *Dogs Fighting*, exhibited in 1819. It was succeeded by the *Dogs of St. Gothard*, the popularity of which was very great. In 1830 he was elected a royal academician, and in 1850 was knighted. Among his most celebrated achievements are: *The Return from Deer-stalking*; *The Illicit Whisky-shill*; *Night-Morning*; *The Children of the Moor*; *Saved*; *Flowers in the Highlands*; *Window Park*; *Squirrels*; *Flowers*.

ing Aya. He was elected president of the Royal Academy in 1865, but declined the honour. He was the most superb animal-painter of his time. **Lane, Edward William**, English orientalist and Arabic scholar, was born at Hereford, 1801, the son of a prebendary. The result of Egyptian visits was his *Manners and Customs of the Modern Egyptians*, still a standard authority. This was followed by the annotated translation of *The Thousand and One Nights*, which was the first accurate rendering. His later years in Egypt were devoted to the great work of his life, the *Arabic-English Lexicon*. Died 1876.

**Lane-Poole, Stanley**, English historian and archaeologist, professor of Arabic at Trinity College, Dublin, 1898-1904; was born in London, 1856; M.A., Oxford, and Dublin; Litt.D., Dublin, 1907; worked in Egypt for the British Museum and government on archaeological research at Cairo, 1895-97; lecturer at the royal institution, 1900-97; member of the Society to the study of the history of Wales, 1901-02. Author: *The Customs of the Arabs and Indian coins as in British Museum*, 10 vols.; *Social Life in Egypt: Studies in a Mosque*; *The History of Mohammed*; *Studies in Oriental Numismatics*, 3 vols., etc. Edited: *Lane's Arabic Lexicon*; *Journal of the Royal Asiatic Society*; *Lane's Koran*; *Transactions of the Middle East Society*.

**Lafrance** (la-frang'), prelate [and scholar, archbishop of Canterbury, was born in Pavia, Italy, about 1005, and 1046 he was chosen prior of the Benedictine abbey of Bec. William of Normandy appointed him a councillor of state, and in 1066 he was elected abbot of a monastery in Caen, where he established a school. Afterward William caused him to be elected to the see of Canterbury, and he was consecrated in 1070. His works consist of commentaries, letters, and sermons. Died 1096.]

[illegible]

Canadian priest, author, and archbishop. He was born in Bonifacio, Manitoba, since 1893, was born at St. Mary's, Ladore, La Prairie, province of Quebec, Canada. He completed his course of theological study at St. Mary's College, Montreal; entered the order of Oblates of Mary Immaculate, 1881, and was ordained a priest in 1884. He was later assigned to the Catholic University of Ottawa, where he became vice-dean of the theological faculty in 1891. He was in Rome in 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 25

**Langston, William**, one of the great figures in early English literature, was born about 1330 near Malvern. He lived most of his life in London in poverty, a clerk and singer of masses for the dead in the churches. An allegorical poem, *The Vision of Piers Plowman*, possibly written by him, containing such a picture of abuses in the church and the state, is one of the earliest and most eloquent cries from an oppressed people. He died about 1400.

**Langton, Stephen**, English prelate, was born about 1160. He studied in Paris, and became the chancellor of Notre-Dame and rector of the university. In 1207 was consecrated archbishop of Canterbury. In 1213 he joined the barons who opposed to the misgovernment of John, and his name stands first among the subscribing witnesses to magna charta. He again placed himself at the head of the barons, in 1223, to demand from Henry III. the confirmation of their liberties. His writings have perished; but to him is due the division of the Bible into chapters. Died 1228.

1228.  
**Lanier (La-ner), Sidney**, American poet, was born in Macon, Ga., 1842. He was graduated at Oglethorpe College, Ga., 1860, and served in the Confederate army during the war. From 1865 to 1872 he practiced law in company with his father at Macon. In 1876 he prepared an ode for the inauguration of Ulysses S. Grant, which in 1877 settled in Baltimore, where he delivered lectures on English literature. In 1879 he was appointed lecturer on English literature at Johns Hopkins University. In the summer of 1880 he returned to his home in Georgia, and in the mountains of North Carolina, where he died 1885. His two notable books are his *Science of English*

**LANKESTER** (*lan-'ke-s-tr*). **Sir Edwin Ray**, English zoologist, was born in London, 1847. He was educated at Downing College, Cambridge, and at Christ Church, Oxford; D. Sc., Oxford and Leeds; LL.D., Cambridge. He was fellow and tutor of Exeter College, regius professor of natural history, Edinburgh, 1882; Lancaster professor of comparative anatomy, Oxford, 1891-92, and director of the natural history department of the British Museum, 1898-1907. Author: *A Monograph of the Cephalopodous Fishes*; *Degenerations*; *The Advancement of Science*. Editor of *A Treatise*.

on Zoology; Extinct Animals; The Kingdom of Man, etc.

**Launee** (lan), **Jean**, duke of Montebello, French marshal, was born at Lectoure, 1769. He entered the army in 1792, and by his conspicuous bravery in the Italian campaign fought his way up to the rank of brigadier-general, 1795. He rendered Napoleon important service, and on the 9th of June, 1800, won the battle of Montebello. In 1809 he commanded the center at Aspern, where he was mortally wounded, and died in that year.

**Landonwe** (*dina'doun*). **Henry Charles Keith** was a statesman. He was born in 1845. He was educated at Balliol Hall, Oxford, England. He was a member of the Oxford. He succeeded to the Liberal Party in 1866, from 1868 held minor offices in the Liberal administration, and in 1872-74 was under-secretary of war. In 1880 he became under-secretary of war, but was ousted by Lord Salisbury. He was Gladstone for the compensation for disturbances in the bill. He was governor-general of Canada, 1883-1888, of India, 1888-94, was secretary in 1895-1900, and in 1900-1905. He held secretary, promoting the trade with the United States and France, and the treaties with Japan.

**Taoise** (16<sup>th</sup>-17<sup>th</sup>), Chinese sage, founder of Taoism, was born in the province of Honan about 604 B.C. He was a contemporary of Confucius, and wrote the celebrated *Tao-te-King* canon, that is, the *Way of the Supreme Being*, the first of the sacred books of China. He was the founder of one of the principal religions of China. His followers formed a sect of mystics, called, as now degenerated into a set of jugglers and magicians. (French), Pierre Matisse, Marquis de Matisse, was born at Beaumont-en-Auge, in Normandy, in 1869. He studied at the Lycée of Caen, and then at the military school there, and afterwards went to Paris. He was gifted with wonderful powers of observation, and was particularly keen on what had for many years defined the attempts of the scientific world to explain the origin of the universe. He was the author of the nebular hypothesis, and together with his friend Laplace, to verify Newton's theory. His *Traité de Mécanique Céleste* was published in 1829, and was the first to meet to Newton's *Principia*, the greatest of astro-

**Lardner, Nathaniel**, English divine, was born in Hawkhurst, Kent, England, 1684. He studied at Utrecht and Leyden; became a minister in his twentieth year; died, having been a chaplain and tutor in the family of Lady Topham, 1757. He was a man of great talents, and acquired equal reputation as a preacher and writer. His most celebrated work is *The Credibility of the Gospel History*. He was also the author of *A Collection of Jewish and Heathen Testimonies*. These two works—the value of which in Christian apologetics can hardly be over-estimated—occupied him for the greater part of forty-three

**Larned, Josephus Neilson**, author and journalist, was born in Chatham, Ont., 1836. He was educated in the public schools of Buffalo; was on editorial staff of *Buffalo Express*, 1859-72; on editorial staff of *Buffalo Courier*, 1872-73; and superintendent of Buffalo library, 1877-87.  
 Author: *A Multitude of Counselors: Friends of Right and Wrong: History of the United States Free Secondary Schools; Seventy Centuries—a Survey*.  
 Editor: *The Literature of American History*.

**La Rocheffoucauld** (la rash'foo'kô'), **François**.  
**Duc de**, French moralist, was born at Paris, 1613.  
 He joined the Frondeurs and was wounded at  
 the siege of Paris. In 1652, wounded again, he  
 retired to the country. On Mazarin's death in  
 1661 he repaired to the court of Louis XIV. A  
 surreptitious edition of his *Mémoires*, written  
 in retirement, was published in 1662; as it gave

wide offense he disavowed its authorship. His *Réflexions, ou Sentences et Maximes Morales* appeared in 1665. His last years were brightened by his friendship with Mme. de La Fayette which lasted until he died, in 1680.

LARRY (*sd*). Dominique Jean, Baron, French surgeon, was born at Bapaume in 1766 and went to Paris, and entered the navy as a surgeon's mate. He served in the wars of 1805-1815, fought in Germany, Spain, and was wounded several times. He married under Napoleon in the war of 1815, and he had a son, who was killed in a campaign. Once he killed his own brother-in-law to make soup for the wounded men under his command. Napoleon said of him: "If the army ever lacks food, I will have soup made from the bones of Larry," and in his will said: "I leave 100,000 francs to Larry in Paris, in which he is now residing in honor and holding Napoleon's will in his hand, once it has been signed." The man who was killed by Larry was also called Larry.

**La Salle** (la sal'), **Kene Robert Cavellier**, **Sieur de** noted French navigator, was born in Rouen in 1633. He came to America in 1667. After a voyage of exploration from Lake Erie to Lake Superior and down the Mississippi, he took possession of the lower portion of the Gulf of Mexico, called Louisiana, after the French king, and great efforts were made to persuade him to colonize it. But quarrels arose between him and the commanders of the fleet, which ended in the return of the ships with fifty of the people, to France. With the others, **La Salle**, bent on his way, but failed to find







in 1779, led to a lasting friendship with the queen. She painted numerous portraits of the royal family. In London she painted portraits of the prince of Wales, Lord Byron, and others.

**Lecky** (*lek's*). **William Edward Hartpole**, British historian and philosopher, was born near Dublin, Ireland, 1838. He was graduated in 1859 at Trinity College, Dublin. In 1861 he published anonymously *The Leaders of Public Opinion in Ireland*, four brilliant essays on Swift, Flood, Grattan, and O'Connell. His later works were *Rationalism in Europe*, *History of European Morals*, *History of England in the 18th Century*, and *Democracy and Liberty* with a volume of poems in 1891. He was elected to parliament for Dublin University in 1895 and again in 1900. *Died*, 1903.

He died in 1865 and again in 1900. DIED. 1900.  
 Dr. Leakey was born in 1827 at Liberty, N.Y., a geologist  
 and physicist; he was born in Liberty county, Ga.  
 He graduated at Franklin College, University of Georgia,  
 in 1841, and the New York College of Physicians and Surgeons  
 in 1845, and practiced medicine in New York City until 1847.  
 He went to Cambridge, Mass., where he studied under  
 Agassiz. He subsequently held several professorships,  
 and in 1869 became professor of geology and natural history  
 in the University of Michigan. His publications include  
 education and the fine arts: *The Mutual Relations of Religion  
 and Science*; *Elements of Geology*; *Sight*; *A Compend of Geology*; *Evolution*, etc. He

born in the Yosemite valley, California, 1801. He died in 1892 at San Francisco, California. E. Lee, was born in Fairfax county, Va., 1835. He was graduated at West Point military academy and held a commission as second lieutenant in the United States cavalry. At the opening of the civil war he resigned and entered the confederate service as a captain in the 1st Virginia cavalry. In 1865 he was elected governor of Virginia, serving until 1890. He was appointed consul-general at San Francisco in 1891 and was later retained at that post by President McKinley. He administered his office with signal ability during the investigation of the explosion of the battleship Maine, and throughout the trying incident preceding the Spanish-American war, in that he was served as major-general of volunteers and his war record was brilliant. He was governor of the province of Havana. He was later appointed brigadier-general in the regular army, April 1901.

Lee, Henry, distinguished American general, was born in Virginia, 1756. He was one of the most daring, vigilant, and successful cavalry officers of the American Revolution. He was probably the most effective and courageous body of troops raised in America. At the battle of the Clouds he routed the British under Francis Watson, Mott, and Granby and Augusta, and at the storming of Fort Mifflin, Lee particularly signalled himself. After the battle he was elected governor of Virginia, and in 1792 was chosen governor of Virginia. His main business was to bring the Indians to great to write a eulogy of him; in it occurs the famous words "First in war, first in peace, and first in the hearts of his countrymen."

**the hearts of his countrymen." Died, 1818.**

**John Jay**, 1737-1829, statesman, patriot, and signer of the declaration of independence, was born in Virginia, 1737, and received his education at King's College, New York, where he became a member of the Phi Kappa Psi chapter in his nineteenth year. In 1764 he was appointed to draft an address to the king, and a year later the same address was adopted by the best state papers of the period. The memorial of congress to the people of British America, and the address to the king, were both drafted by Great Britain, were both from his pen. In June, 1776, he introduced the measure that declared the colonies free and independent, and which was reported it by a speech of the most brilliant eloquence. He continued to hold a seat in congress until 1780, when he was elected a resident minister to France. He returned to his native land in 1784. In that year he was chosen president of congress, but retired at its close, and in 1786 was again chosen a member of the original committee of the convention, the convention which adopted the present constitution of the United States, and one of the first ratifiers of it. In 1792 he resigned from public life, and died in 1829.

**Lee, Robert Edward**, American general. was born in Westmoreland county, Va., 1807. At eighteen he entered West Point, was graduated second in his class in 1829, and received a commission in the corps of engineers. In the Mexican war he distinguished himself by his valorous conduct, and at the storming of Chapultepec was severely wounded. In 1852-55 he was superintendent of the Washington Arsenal, and his administration greatly improved its efficiency. He was in command of the Department of the Columbia at Washington in March, 1861, when seven states had formed the southern confederacy. Virginia seceded April 20, 1861, and he was ordered to prove that his allegiance was due to his state, sent in his resignation. Within two days he was made commander-in-chief of the army of the Potomac. At Richmond he superintended the defense of the city until April 1862, when he was ordered to oppose General Rosecrans in West Virginia. His mastery strategy in the seven days' battle of Manassas, August 31, 1862, was the cause of the

ties and strategy in opposing General Pope, his invasion of Maryland and Pennsylvania, and other achievements are cardinal to the history of the war. On April 9, 1865, Lee surrendered to General Grant at Appomattox, Virginia. The war was practically ended. After the close of the war he frankly accepted the result, and, although deprived of the presidency and the army, he remained in the White House on the Family, he declined proffered offers of pecuniary aid, and accepted the presidency of what came to be called the Washington and Lee University at Lexington, Va. His noble head be remained untarnished in 1870. Numerous military critics regard Lee as the greatest military leader produced by the civil war, and one of the very first produced by

born in Liverpool, England, 1866. He was educated at Liverpool College, and engaged in business seven years, but abandoned it for literature. He was introduced to the poetess by Mr. Wilson Barrett, then became literary critic for several papers, and settled in London. For some years he was journalistic and literary work has been his chief occupation. His works are: *My Ladies' Sonnets*; *Volumes in Folio*; *George Merdith*; *The Book-Bills of Narcissus*; *English Poems*; *The Religion of a Literary Man*; *From the East to the West*; *From the West to the East*; *The Beautiful Life of Rome*; *Rudyard Kipling, a Criticism*; *The Life Romantic*; *Sleeping Beauty*; *Mr. Sun and Mr. Moon*; *Odes from the Dream of the Night*; *Painted Shadows*; *Little Dreamers with the Spring*, etc.

**Legat, (sic), Hugh Swinton**, American statesman, was born in Charleston, S. C. 1797. He studied law, traveled in Europe, and was a member of the South Carolina legislature, 1820-22 and 1824-30. In 1830 he was elected attorney-general. He was *chargé d'affaires* at Brussels, 1832-36, and took his seat as a member of congress during the session of 1837. After the accession of President Tyler in 1841, Legat was appointed attorney-general, and in 1842 he was in the cabinet. In 1843 he succeeded Webster as secretary of state. He was distinguished as a scholar, and contributed largely to periodicals. Died, 1843.

**Leibnitz, Gottfried Wilhelm**, von perhaps the most extraordinary example of universal scholarship upon record, was born 1646 at Leipzig. In 1672 he submitted to Louis XIV. an essay entitled *Consilium Aegyptiacum*, containing a plan for the invasion of Egypt, which is by some supposed to have led to the Egyptian expedition of Bonaparte in 1798.

He was the chief organiser of the academy of Berlin, of which he was the first president and originated both the Prussian and the Vienna project for the establishment of similar bodies. It was to him, likewise, that Peter the Great owed the plan of the since celebrated academy of St. Petersburg. He was eminent in languages, history, divinity, philosophy, political studies, experimental science, mechanical science, and even belles-lettres. But it is through his philosophical reputation that he lives in history.

The principal metaphysical speculations of Leibnits are contained in his *Theodicee*, *Nouveaux Essais*, *Système nouveau de la Nature*, *De Ipsa Natura*, *Monadologie*, and in portions of his correspondence. He contended that the soul is an innate substance holding that there are necessary truths which cannot be learned from experience, but are innate in the soul, not, indeed, actually forming objects of knowledge, but capable of being brought to light by reflection. Authorities seem generally agreed that Leibnits discovered the differential calculus independently of any knowledge of Newton's method of fluxions, so that each of these great men of reality attained the same result for himself.

**References.**—Guhrauer's *G. W. F. Leibnitz*; Dewey's *Leibnitz's New Essays Concerning the Human Understanding*; Stein's *Leibnitz* [and Spinoza]; Mers's *Leibnitz*; Latta's *Leibnitz: The Monadology and other Philosophical Writings*; Russell's *A Critical Exposition of the Philosophy of Leibnitz*.

**Leighton** (lô'tun), **Frederick, Lord**, English painter, was born at Scarborough, England, 1830. His early years were spent in the study of art. He was a pupil of the masters in Rome, Florence, Frankfurt, Paris, and Brussels. His famous picture, "Cimbuë's Madonna carried in Procession through the Streets of Florence" was his first appearance in the Royal Academy in 1755, and was at once purchased by the queen. Among his other paintings are "Madonna and Child" and "John the Baptist." In 1878 he became president of the Royal Academy, was made a baronet in 1885, and raised to the peerage in 1896. In his life.

time he received almost every honor possible to an artist. Died, 1896.

**Levesque, Melphie**, French statesman, post-master-general, and minister of labor of Canada since 1906, was born at Montreal, 1866. He was educated at the seminary of Nicolet, and at Laval University, Montreal; barrister, 1891; Q. C., Quebec, 1898, and K. C., Ottawa, 1904. He was a member of parliament for Gaspé, 1896; re-elected, 1900 and 1904; represented Canada before the privy council in England, 1904; solicitor-general of Canada, 1904-06; fellow of the royal society of Canada, 1908. He is the author of several works on law, and a number of addresses.

**Knabach** (see *Box*). **FRANZ** von, noted German portrait painter, was born at Schrebenhausen, Bavaria, 1836. He studied at the Munich Academy under Gräfe and Piloty, and in 1858 went to Rome. In 1860 he became professor of art at Weimar, but resigned in 1862 and went to Italy. In 1863 he returned to Munich but devoted himself exclusively to portraiture, but after 1872 spent much time in travel and work in Vienna, Morocco, and Egypt. His portraits of Bismarck are specially famous. Died, 1904.

**Leo I., the Great**, pope of Rome 440-461, was born about 390. He succeeded Sixtus III. in 440; zealously opposed the Manichaeans and Pelagians, and secured the condemnation of the Eutychian heresy at the general council of Chalcedon; extended the Roman see, and induced Attila to spare Rome. He published several volumes of letters and sermons. Died at Rome, 461.

**Leo X, Pope** (Cardinal Giovanni de' Medici), son of Lorenzo the Magnificent, was born in Florence, Italy, 1475. He was banished with his family in 1497; traveled in Germany and Flanders, and formed a friendship with Erasmus. On his return to Italy he became legate to Julius II.; was taken prisoner in 1511, and released, and then became pope in 1513. In 1515 he signed the famous concordat with Francis I. His pontificate is one of the most brilliant periods in the history of art and literature, and is also memorable as the time when the reformation began. Died, 1521.

XIII. Pope (Giosuèpe Pecci), son of Count Ludovico Pecci, was born in Carpineto, in the Kingdom of Naples, on 18 June 1812. He studied in the Collegio Romano and the Academy of Noble Ecclesiastics; appointed by Gregory XVI, in 1847, Bishop of Perugia and later sent to Belgium as Legate in 1848. He was elected Pope in 1846. In 1853 created a cardinal by Pius IX. Upon the death of Pius IX in 1878 he was elected Pope and reigned until 1891. In 1870 he restored the hierarchy in Scotland and composed the difficult with Germany. He was a prisoner at the Vatican, and persecuted the Protestants. He was a defender of the Jesuits. He protested against heresy and "godless" schools, and in his encyclicals affirmed that the influence of the papacy. In 1894 he constrained the French clergy and the Italian bishops to return to Rome and he opened the archives of the Vatican for historical investigations, and made the first encyclical on the tongue. The jubilee of his episcopate in 1893 was marked by pilgrimages, addresses, and gifts. He issued an encyclical pronouncing Anglican orders invalid. He died on 20 July 1903. One of his last acts of his death was one of the foremost figures of modern times, and a potent force in religion.

Leonardo da Vinci (lě'ōndr'dō, dā vĕn'chō). See Vinci.

**Leonidas I.** (*480-476 B.C.*), king of Sparta, succeeded Cleomenes I. in 491 B.C. When the Persian monarch, Xerxes, approached with an immense army, Leonidas opposed him at the narrow pass of Thermopylae, 480 B.C., with a force of 300 Spartans and more than 5,000 auxiliaries. The treachery of one Ephialtes having made it impossible to bar any longer the progress of the foe, Leonidas and his little band threw themselves on the swarming myriads, and found

**Lepsius** (lep'is-oo), Karl Richard, noted German Egyptologist, was born at Naumburg, 1810. He came to Rome for study in 1836, and remained there until 1842, when he returned to Naumburg to treat his father's affairs. In 1842-45 he was at the head of an antiquarian expedition sent to Egypt by the king of Prussia, and in 1846 was appointed professor in Berlin. His *Chronologie der Aegypter* laid the foundation for a scientific treatment of early Egyptian history. His other works consist of letters from Egypt, Ethiopia, and Sinal, 1852; the *Antiquities of the Egyptians*, 1855; or the *Egyptian Book of the Dead*, 1858.

**Lesage (d' died), Alain René**, French novelist and dramatist, was born in Sarzeau, in Brittany, 1668, and studied at the Jesuits' College at Veneux. After having held a situation under the farmers-general in his native province, he went to Paris in 1692, tried the bar for a short time, and then adopted the profession of an author. For some years he continued to be little known as a writer;

but in 1707 he rose at once into popularity by his comedy of *Croquis, the Rival of his Master*, and his romance of *Le Diable*. The comedy of *Turcaret*, in 1709, added to his fame, which subsequently was rendered imperishable by his remarkable *Gil Blas*, which, upon the twenty-fourth dramatic pieces, had and a share in the composition of seventy-six others. He died in Paris, 1741.

**Leassap (Usarp), Ferdinand, Viscount de**, French engineer and diplomat, was born at Versailles, 1805. He held the post of chief of staff in 1854 proposed to the viceroy of Egypt the cutting of the Suez canal, and completed the same in 1869. He was engaged in the construction of the canal across the isthmus of Panama, since taken over by the United States. The sentence of imprisonment pronounced upon him by the French government in 1893, as one of the officers of the French Panama canal company, was never enforced. Died 1894.

**Lessing, Gotthold Ephraim**, German critic, dramatist, and scholar, was born 1729 at Kaments, in upper Lusatia. He entered the University of Leipzig in 1746 to study theology, but his love of the drama and his intimacy with Schlegel, Mylius, Weisae, and other young men of literary tastes, led him to abandon this intention.

After a short stay in Wittenberg he went, in 1748, with Mylius to Berlin, where he wrote for magazines and booksellers. He also undertook, with Mylius, in 1750, a publication entitled *Beiträge zur Historie und Aufklärung der Theatralischen Kunst*. He was the History and Improvement of the Theater," published some poems under the title of "Kleinigkeiten" ("Trifles") translated a work of the Spanish philosopher, Suarez, and wrote some articles in *Voss's Gazette*. He entered at this time into friendly relations with Moses Mendelssohn and the bookseller Nicolai, in conjunction with whom he established the critical journal, *Brandenburgische Literaturzeitung* ("Letters on the Newest Literature").

In 1755 appeared *Miss Sara Sampson*, a tragedy dealing with English life. In 1757 Lessing became secretary to General Tauentzien in Breslau for five years, when he returned to Berlin and published the *Laokoon oder über die Grenzen der Malerei und Poesie*, or *On the Limits of Painting and Poetry*, and his comedy *Minna von Barnhelm*. About 1767 he became director of the National Theater at Hamburg. While here he wrote *Emancipation*, his first drama, which had enemies, and having been compelled to quit Hamburg, the Duke of Brunswick appointed him his librarian at Wolfenbüttel.

In 1775 he visited at Vienna, and accompanied Prince Leopold of Brunswick to Italy. He married in 1776, but his wife died in little more than a year. At this period he was involved in fierce theological disputes, with his philosophical drama *Nathan der Weise* did nothing to ally. Besides those mentioned, he wrote another drama, *Emilia Galotti*. He died at Brunswick in 1781.

**References.**—Biographies by Daniel and Gubrauer, Erich Schmidt, Borinski, Sime, Helen Zimmern, Rohlfen, and Stahl's *Life and Works of Lessing*.

**Leutze (Lutts), Emanuel**, German-American painter, was born at Gernsdorf in Württemberg, 1815. He was brought up in America, and in Europe, 1841-59, then settled in New York. Among his works are: *Washington crossing the Delaware*; *Washington at Annapolis*; *Landing of the Norwegians*; *Cromwell and his Daughter*, etc. Died at Washington, D. C., 1868.

**Lewis (L'Évê), Charles James**, Irish novelist, was born at Dublin, 1806. He was graduated at Trinity College in that city, 1827; studied medicine at Göttingen, and then at Leiden. He was his most popular work, *Charles O'Malley*, is a reflex of his own college life at Dublin, and many of the incidents in this novel are not far from his own experience in the world. He died at Trieste, Italy, 1872.

**Lewis (L'Évê), Henry**, English philosopher and critic, was born in London, 1817. He was educated partly at Greenwich under Dr. Burney, and partly in a school in the Strand. He was early to enter first a notary's office, and then the house of a Russian merchant. In 1838 he proceeded to Germany, and remained there for about two years, studying the life, language, and literature of the country. He was married unhappily and had children when he was twenty-four. Eliot began in 1854; it ended only with his death at their house in Regent's Park, 1878. Lewis was one of the best of the English novelists, and a popularizer of philosophy he was inferior to none, as a popularizer of science he was inferior

to few. His works, besides a tragedy and two novels, include: *Biographical History of Philosophy*; *History of the Philosophy of Science*; *Life of Aristotle*; *On Actors and the Art of Acting*; *Problems of Mind*, etc.

**Lewis, Albert**, American professor, was born at Westbury, N. Y., 1866. Graduated from Alfred University, 1887; Ph. D., Syracuse University, 1890. He was professor of Philosophy at the University of Chicago, 1888-90; professor of Latin, Alfred University, 1890-92; assistant in rhetoric, 1893-94; 1895-96, professor of Latin, University of Chicago; associate professor of English, 1896-99, University of Chicago and Lewis Institute; professor of English and Latin, 1899-1906, Lewis Institute, Chicago. Author: *The History of the English Language*; *A First Book in English*; *A First Book in Latin*; *A First Book in Greek*; *An Introduction to the Study of Literature*; *A Second Manual of Composition*; *Specimens of the Forms of Diversified Applied English Grammar*, etc.

**Lewis, Meriwether**, American explorer, was born near Charlottesville, Va., 1774. In 1803-06 he was engaged with Captain William Clarke in an expedition to the Pacific Ocean, the results of which were important to geographical science; and in 1807 he was made governor of Territory of Louisiana. He was subject to periods of mental depression, in one of which he is said to have taken his life near Nashville. His memoir by Jefferson was published, together with Biddle and Allen's *Narrative of the Lewis and Clark Expedition*, in 1814.

**Lewis, William Draper**, American educator and law writer, dean of the law department, University of Maryland, since 1895. He was born at Philadelphia, Pa., 1867. He was graduated at Harvard, 1888; at the University of Pennsylvania, 1891. Ph. D., 1891. Author: *Foreign Trade, Over Commerce and Its Effect on State Action*; *Our Foreign Trade*; *History of the Development of International Law*. Editor: *Law of Evidence*, 3 vols.; *Wharton's Criminal Law*; *Lewis' Biographical Dictionary*, 2 vols.; *Decisions of the Supreme Court of Appeals*, etc.

**L'Épital (L'Épital), Michel de**, French statesman, was born about 1507. He was president of the court of accounts, 1554-60, and afterward minister of France until 1568. He was the edict of Romorantin, which excluded the Huguenots from France; the ordinance of Orleans, which put an end to the religious wars; and the edict of pacification, for the free exercise of Protestant worship; and the ordinance of Moulins, which reformed the administration of justice. He died in 1573.

**Liddon (Lid's), Henry Parry**, English clergyman, was born at North Walsham, Norfolk, 1827. He was graduated at Christ Church, Oxford, 1850; was ordained in 1852 as senior student of New College, Oxford, 1854; and became principal of Cuddesdon theological college, and in 1864 became a prebendary of Salisbury, in the diocese of St. Paul's, and a lecturer of exegesis at Oxford, until 1882. In 1886 he declined the bishopric of Edinburgh, and in 1887 visited the holy land. Canon Liddon was the most able and eloquent exponent of liberal high church principles. He died suddenly at Weston-super-Mare, 1900.

**Lieber (L'Évê), Franz**, German-American publicist, was born in Berlin, 1800. After suffering imprisonment for his political opinions, he came to America in 1827, and was made professor of history in South Carolina College, 1833-36, of political economy in Columbia College, 1837-40, and of political science in Columbia law school, 1860-72. He edited the *Encyclopedia Americana*, 1843-44; *Encyclopedia Britannica*, 1845-46; *Government*; *Guerilla Warfare*, etc. Died 1872.

**Lebig (L'Évê), Eugen von**, German chemist, was born at Darsdorf, near Leipzig, at Bonn and Erlangen; then went to Paris, and attracted the attention of Humboldt by a paper on the action of St. Paul's, and a lecturer of exegesis at Oxford, until 1882. In 1886 he declined the bishopric of Edinburgh, and in 1887 visited the holy land. Canon Liddon was the most able and eloquent exponent of liberal high church principles. He died suddenly at Weston-super-Mare, 1900.

**Li Hung Chang (L'Évê, 'ch'ang)**, Chinese statesman, was born in 1823, and studied at Hankin in 1843. He was appointed to the post of minister to the imperial army as secretary. In 1864 he was appointed governor-general of the Kiang provinces, and in 1872 he was appointed grand secretary. He founded the Chinese navy and promoted a native mercantile marine. On the outbreak of the war with the English in 1894 he was appointed commander in chief of the navy in supreme command of the military and naval forces in Korea, was thwarted by the incompetence of the army and navy, and in 1895 the Chinese forces were swept out of Korea, and the whole policy was that of peace, was deprived of his position, and succeeded in securing the return of his last command be refused to comply, and the disastrous course of events soon compelled the emperor to restore him to restore him to his post. His efforts for the war was brought to a termination in 1895, China ceding Formosa and paying a war

indemnity of \$175,000,000. Professedly friendly to foreigners, and well aware of the value of western science, he was engaged in the various works of Germany, France, England, and America in 1860. He died in 1901.

**Lincoln, Abraham**, American statesman, and the sixteenth president of the United States of America, was born in Kentucky 1809. He removed with his family in 1816 to Spencer county, Indiana, and for the next ten years was engaged in law visits with various kinds, having only about a year's schooling at intervals.

At the outbreak of the Black Hawk war in 1832 he joined a volunteer company, and as captain he served three months in the campaign. He next opened a country store, was appointed postmaster of New Salem, Illinois, began to study law, and at the same time turned amateur lawyer. In 1834 he was elected a member of the Illinois legislature, to which he was again returned at the three following biennial elections, and in 1836 he was licensed to practice law.

In 1846 he was elected a representative in congress from Illinois, and voted steadily in congress with the anti-slavery party. In 1849 and again in 1850 he was unsuccessful in attempts to enter the United States senate. In the Republican national convention held at Chicago in May, 1860, he was nominated as a candidate for the presidency, and after several weeks of canvassing he was eventually chosen unanimously. The southern states alarmed at the aggressive anti-slavery policy which many of the leading Republicans advocated, their determination to follow, refused to acquiesce in Lincoln's election, and began one after another to announce their secession, and to organize the means of resisting the enforcement of the claims of the central government.

The election of Lincoln took place in November, 1860, and he assumed office on the 4th of March, 1861. It was the intention of Lincoln to use the force of the constitution consistent with the policy he deemed it essential to the national interest to pursue. On one point, however, his resolution was steadfast, to admit no secession, and before his secession office secession was as resolutely determined on the other side. On the 4th of February the southern confederacy had been constituted, and on the 12th of March the Confederate States of America was struck by the capture of Fort Sumter by the Confederates.

The events of the civil war during the next four years in Lincoln's career belong to the history of the United States. Lincoln's persistence in raising and pouring in fresh troops after every disaster finally enabled the Federal government to subdue the secession. The toleration of slavery was always in Lincoln's opinion an unhappy necessity; and when the southern states had by their rebellion forfeited all claim to the protection of their peculiar institutions, it was an easy transition from this view to its withdrawal. The successive stages by which this was effected—the emancipation of the slaves of rebels, and the offer of compensation for voluntary emancipation, followed by the constitutional amendment and unconditional emancipation without compensation—were only the natural steps by which a change involving consequences of such vast extent was reached.

The determination of the northern states to pursue the war to its conclusion on the original basis of the Union, was the decisive event in 1864. The decisive victory of Grant over Lee on April 24, 1865, speedily followed by the surrender of the latter, had just afforded the prospect of an immediate termination of the long struggle, when on the 14th of the same month, President Lincoln was shot in Ford's Theater, Washington, by the assassin John Wilkes Booth, and expired on the morning of the 15th. The actions of America Lincoln holds a place second only to Washington.

**References.**—Nichols and Hay, *Abraham Lincoln*; and many other authors, see *Complete Works of Abraham Lincoln*. See also *Lives* by Morse, Arnold, Hurdson and Weik, Lincoln's *Life* by Todd, *History of the United States from the Compromise of 1850*, Lincoln, Robert Todd, American lawyer, was born

at Springfield, Ill., 1843, eldest son of Abraham Lincoln. He was graduated at Harvard, 1864; entered Harvard Law School, but left to enter the army, serving until 1865, when he was promoted to General Grant. He then finished his law studies, was admitted to the Illinois bar, 1867, and practiced at Chicago until 1870, when he was elected, 1880; secretary of war, 1881-83, and United States minister to Great Britain, 1889-93. He is also vice-president of the Commonwealth Edison company; Central Union telephone company, Commercial National bank, Pullman loan and savings bank, etc.

**Lind, Jenny** (Madame Otto Goldschmidt), the Swedish singer, was born in Stockholm, Sweden, 1820. At three years of age she could sing correctly any piece she had once heard, and at nine was placed under Crolius, a famous teacher of music. She was married in 1850 to Otto Goldschmidt, the pianist, and was enthusiastically received, but disclosed the engagement prematurely in 1851, was married to M. Otto Goldschmidt, a skillful pianist and conductor, and retired from the stage. She reappeared in 1855, in 1861, in 1863, and in 1860 for a limited period. She was professor of singing at the Royal College of Music, Wiesbaden, 1883-86. She died in Wynd's Point, Malvern, England, in 1887.

**Lindsey, Benjamin Barr**, jurist, reformer, was born in Jackson, Tenn., 1869. He was educated in the public schools studied law and was admitted to the bar. Judge of the circuit and juvenile court of Dever, Colo., since 1900. He is the originator of the juvenile court system and has an international reputation as an authority on juvenile delinquency. In 1906 he was a candidate for governor of Colorado. Author: *The Beast and the Jungle*.

**Linerich (lin-erich) Nikolay Petrovich**, Russian general, was born in the government of Tvergouff in 1828. He served in the Russo-Turkish war and in 1900 succeeded to the command of the Siberian troops in Manchuria. In 1904 he commanded the Russian troops in the battle of Mukden in the Russo-Japanese war and succeeded General Kuropatkin in 1905 as commander-in-chief in the Far East. Died in 1907.

**Lingard, John**, noted English historian was born in Winchester 1771. He studied for the Roman Catholic priesthood, but after the death of his father, four years old. His greatest work is the *History of England* in 10 vols. After his *History of England* was published in 1809, he published a manual that which he refused. He died at Hornby near Lancaster 1851.

**Linné (lin-né) Karl Von**, commonly called Linnaeus, the greatest botanist of his age, was born at Rasmult, Sweden, 1707, and died at Upsala in 1778. He was the son of a clergyman, who was a learned and a good grammar-school and the gymnasium of Wexjö. He showed an early interest in botany; entered the University of Lund, where his botanical ideas were encouraged; and removed to Upsala in 1729, where he undertook the supervision of the botanic garden. Here he made the acquaintance of the botanist Rudbeck, whose assistant he became.

Aided by the academy of sciences at Upsala, Linné made a journey through Lapland, the result of which was shown in his *Flora Lapponica*, published 1735. In this year he went to the University of Harderwijk in Holland and took an M. D. degree; afterward visited Leyden, where he published the first sketch of his *Systema Naturæ* and *Fundamenta Botanica*. He then visited England, went to Paris in 1738, and afterward settled in Stockholm as a physician.

He became professor of medicine at Upsala in 1741, and then of botany. His life history was made a knight of the Polar Star with the rank of nobility; and died on his estate near Upsala from apoplexy.

The great merit of Linné as a botanist was that he arranged the plants on a simple system of sexual relationship and prepared the way for the more natural and satisfactory classification which has superseded the Linnaean system. He must it be forgotten that he was eminent not only in botany, but in all the sciences of his time. His chief works besides those already mentioned were: *Genera Plantarum*, Cited plantarum in Suecia, *Flora Suecica*, *Philosophia Botanica*, and the *Species Plantarum*.

**References.**—Nash's *History of Botany*; *Curtis's History of Zoology*; *Smith's History of Sir Charles Linnaeus*; Caddy's *Through the Fields with Linnaeus*.

**Lipton, Sir Thomas Johnstone**, British sportsman and merchant was born in Glasgow, of Irish parentage, 1850. He started life as a retail merchant, acquired a small fortune in coffee and cocoa estates in Ceylon, and accumulated a large

fortune. He is chairman of Lipton, Ltd., and is also largely interested in business enterprises in the United States and Canada. He owned the *Illustrated London News*, and was staff editor and challenged for the American cup 1889, 1901 and 1904. He was knighted in 1898, and created a baronet in 1907.

**Lister, Joseph, Lord**, English surgeon, was born in Upton, England, 1827. He was graduated at Edinburgh, Scotland, 1847, and then studied in Paris. He was successively lecturer on surgery, Edinburgh; regius professor of surgery, Glasgow; professor of surgery, 1862; and surgeon-in-chief of clinical surgery, King's College hospital, London, and surgeon-extraordinary to Queen Victoria. His contributions to the study of the coagulation of the blood, inflammation etc., his great work has been the introduction, since 1865, of the antiseptic system, which has revolutionized modern surgery. He has received many foreign honors, and was made a baronet in 1883 and a peer in 1897.

**List (list) Franz**, noted Hungarian pianist and composer, was born at Raiding, 1811. In 1849 he became conductor of the court theater at Weimar; in 1861 was made commander of the legion of honor, and in 1865 took orders and received the tonsure. In 1871 his native country granted him a pension of 600 pounds a year, and in 1875 he was named director of the Hungarian Academy of Music. He was married to the actress married Richard Wagner, his lifelong friend. Though List's fame as a pianist overshadows his work as a composer, yet his *Madama Butterfly* and the symphonies and his *Hungarian Rhapsodies* for the piano are unrivaled. He died at Raiding, 1886.

**Littman, Simon**, educator, economist, was born in Odessa, Russia, 1873. He was educated at Odessa Commercial College, University of St. Petersburg, Paris, at the University of Zurich, and University of Munich; lecturer at the Russian School of Commerce in Paris, 1902; instructor in Mathematics University of California, 1903-1908; associate in commerce, 1909-1910, and assistant professor in commerce, 1910-1911, at the University of Illinois. Member of the American Economic Association, American Statistical Association, American Association for Economic Research, National Geographic Society, Author of *Trade and Commerce*; *Die Statistik*, *Commercia*, and of many articles on commerce, commerce and trade statistics.

**Littledale, Charles Edgar**, American lawyer, ex-congressman, was born in Lebanon, York county, Me., 1851. He received a liberal education, was admitted to the bar, 1876, and rapidly acquired a high reputation for legal and literary attainments. Attorney-general of Maine, 1880-93; elected to 60th congress, 1889, to fill vacancy caused by the death of Nelson W. Dodge, and re-elected to 61st and 62nd congresses from second Maine district. In 1908 he retired from congress and took up the law in New York City.

**Littlen, Martin W.**, American lawyer, was born in Boone county, Tenn., 1872. He was practically self-educated and began practicing law in 1891. He was assistant prosecuting attorney, Dallas, Texas; delegate from New York to national democratic convention, 1904; and has appeared in many famous legal trials. He was elected to Congress 1910.

**Littlen, Sir Thomas**, English jurist, was born in Wrexham, Cheshire, England, 1402. He was recorder of Coventry in 1450, king's serjeant in 1455, in 1460 judge of common pleas, and in 1473 a knight of the bath. His reputation rests on his treatise on *Treason*, written in law French, and turned into English about 1600. He was called "the Coke commented on in his *Coke upon Littlen*. Died, 1581.

**Littlen, Maximilien Paul Emile**, French philosopher and philologist, was born in Paris, 1801. He studied at the Lycée Louis-le-Grand, then at the University of Bonn, where he turned to philology. He fought on the barricades in 1830, and was one of the principal editors of the *Nation* down to 1831, and became an enthusiastic follower of Comte. His *La Poésie Homérique* of 1836, and *La Poésie Française* of 1840, are the first book of the *Hand in the art of the Trouvère*. His splendid *Dictionnaire de Littérature* was projected in 1840, and he died in 1863 from rejecting its author, whom Bishop Dupanloup denounced as holding impious doctrines, and the academy refused to publish him. He was one of the first linguists and aesthetes of this century. Died, 1881.

**Livingston, Edward**, American jurist and statesman, was born at Livingston, N. Y., 1724. He was elected a member of congress in 1794, and became federal attorney and mayor of New York in 1795. He was elected to congress in 1803, he became aide-de-camp and secretary to General Jackson. In 1824 he was appointed to draw up the treaty of peace between the United States for Louisiana, 1820-31; secretary of state, 1831-33; minister to France, 1833-35, and supported the annexation of Texas in 1845, and the government for indemnity on account of French

spoliations, and succeeded in securing its payment.

Died at his own estate on the Hudson, 1836. **Livingstone, David**, African explorer and missionary, was born at Blairgowrie, Scotland, 1813. Was sent to southern Africa by the London missionary society in 1840; resented for several years, and died at the Cape, 1853, discovering Lake Ngami in 1849, and penetrating to the Malakole country in 1851; in 1853-54 and 1855, he discovered Lakes Shiraz and Nyama, and in 1865 published a narrative of his journey. He undertook his third expedition in 1866, and spent the remainder of his life endeavoring to ascertain whether the Nile flowed from the water-system west of Lake Tanganyika. In 1871 he was found by Stanley at Ujiji. He died in central Africa, 1873.

**Livy, or Titus Livius**, Roman historian, was born at Patavium (Padua), in the north of Italy, 59 B. C. He was the most eminent of the Roman historians. His history of Rome was written partly at Rome and partly at Naples, under the patronage of the emperor Augustus. It consisted of 142 books, but only some of the early thirty-five have come down to us. It is one of the very imperfect state. Of all but two, however, only the archaic and the last few books have come from another hand. The history, or at least, was called by its author, *The Annals of the Roman People*, and it is a work of great value, and ends with the death of Drusus, the youngest brother of the emperor Tiberius, 9 B. C. Died, 17 B. C.

**Loeare (lo-ear-ah)**, Juan Antonio, Spanish historian, was born at Xicoen del Noto near Calaspar, 1756. He was educated at the University of Toledo. King Joseph gave him sundry posts, and in 1807, when the invasion was suppressed, became his archivist. He died in 1823, having written his history. He died at Madrid, 1823.

**Locke, George Herbert**, Canadian educator, professor of education, and dean of training school for teachers, Macdonald College, McGill University, Montreal, Canada, since 1907, was born at Etobicoke, Canada, 1869. He was educated at Victoria College, University of Toronto, and University of Chicago; instructor in history and political science, 1890-91; at Queen's College, Cambridge, Mass., 1897-99; associate professor of education, University of Chicago, 1900-01; and of education, University of Chicago, 1901-02. He is the author of *The Quarterly Journal of Pedagogy*, 1907. He is the author of many contributions to educational periodicals.

**Locke, John**, eminent English philosopher, was born at Wrington, in Somersetshire, 1632, and died at Oates, Essex, 1704. He was sent to Christ church, Oxford, where he took the degrees of B. A. and M. A., and applied himself to the study of medicine. In 1666 Locke made the acquaintance of Lord Ashley, afterward earl of Shaftesbury, and held various offices in the patronage of that nobleman. When in 1682 his patron was obliged to retire, for political reasons, to Holland, Locke accompanied him to his exile. Owing to the troubled condition of his country, and the continued triumph of the party which he had opposed, Locke continued in exile until 1689.

He returned to England at the revolution, and was appointed commissioner of appeals under the new government. As early as 1670 he had formed the plan of his famous *Essay on Human Understanding*, in which he had carefully elaborated in his exile, and which he published in its completed form in 1690. It was received with much opposition, notably by the University of Oxford, which resolved to discourage it; but despite this it acquired a great reputation throughout Europe, and was translated into French and German. Locke was made a commissioner of trade and plantations in 1695, but retired when unable to perform its duties, and lived with his friend Sir F. Masham until his death.

His *Essay* must be stated that the chief purpose of Locke's celebrated *Essay* was to find the original sources and the scope of human knowledge. The conclusions he arrived at were that the human mind is a "white paper," that the human mind is a sheet of white paper prepared to be written upon; that the knowledge thereon written is supplied by experience; and that the mind is a reflection of the sources of all our ideas.

Among other works of Locke are his *Letters on Education*; *Thoughts concerning Education*;



expression of the ruling principles of his life, and a description of his policy. On the death of Philip IV, the king of Spain, Louis claimed to Holland, which he invaded; but this led to the alliance against him of England, Sweden, and Holland, usually called the League of Augsburg, and Louis was speedily compelled to make peace. Several others were followed, notably the war of the Spanish succession, in which Louis sought to secure the Spanish monarchy for his grandson, the duke of Anjou. Two years afterward, 1715, Louis died at Versailles, after a reign of 43 years. He left several children. Many of the most famous names in French literature belong to this reign.

**Louis XV.**, surnamed "the well-beloved," king of France, 1715-74, was born at Fontainebleau, 1710. He was the son of the duke of Burgundy and the successor of his great-grandfather, Louis XIV. On the death of Augustus, king of Poland, 1733, Louis supported the pretensions of his father-in-law to the vacant throne, and was opposed by the emperor of Germany, who upheld the claims of the elector of Saxony. Afterward, in 1755, a new war was kindled between England and France, about their possessions in Canada; and this war was not terminated until 1763, when, by the treaty signed in Paris in that year, France formally ceded to England Canada, Nova Scotia, and its other North American possessions, Florida, Granada, Dominica, and Tobago, in the West Indies. During the latter part of his reign, Louis was to be governed wholly by favorites, among them were the Marchioness de Pompadour and Madame de Barry.

**Louis XVI.**, king of France, 1774-93, was born at Versailles, 1754. He was the grandson of Louis XV., whom he succeeded on the throne in 1774. In 1770, married Marie Antoinette of Austria, daughter of Maria Theresa, and sister of the emperor Joseph II. The first years of Louis's accession, endeared him to his people, for he gave them immunities to which they had been hitherto unaccustomed, and he was popular in the administration; but he soon became embarrassed by financial difficulties, and was not fortunate in his choice of ministers. A mob of armed women from Paris made an attack on the palace of Versailles, after which the king and queen were forcibly taken to Paris. In 1789 the states-general of the kingdom was convoked at Versailles. Within a few days it was transformed by the representatives of the people, and assumed the whole legislative authority; and then began the revolution, which culminated, as far as the king was concerned, in his execution in 1793, and in his execution on the scaffold in 1793.

**Louis XVIII.**, king of France, a younger brother of Louis XVI., was born at Versailles, 1755. He fled from Paris on the same night as the king. Louis XVI. reached the frontier, and Louis XVIII. assumed the dashing king, under the title of Louis XVII., and in 1795 he was crowned king himself. The fall of Napoleon opened the way for him to the French throne and in 1814 he landed at Calais after twenty-four years of exile. He ruled by "the divine right of kings." The revolution had taught him nothing, and the followers of Napoleon, opened the way for Napoleon's return from Elba, when he fled into exile until after the battle of Waterloo. He was restored to the throne by the allied powers in 1815, and ruled until his death at Paris, 1824.

**Louis Philippe (10<sup>th</sup> of his name)**, king of France, was born at Paris, 1773, eldest son of Louis Philippe Joseph, duke of Orléans. He sought, during the revolution, in Switzerland a place of security for his sister Adelaide, wandered about for four months, and accepted a place of refuge in geography and mathematics in a school at Reichenau, near Chur, assuming the name of Chabaud-Latour. On the fall of Napoleon he fled to Paris, where he was received with distrust by Louis XVIII. After the second restoration, when he came to the throne, he was treated with great esteem. He was very popular in Paris. He kept aloof, however, from political intrigues; and the bloody days of the revolution passed, and he nearly over before he was brought forward, the banker Lafitte proposing, in the provisional committee, his appointment as king, and the approval of the kingdom, from which he proceeded to the acceptance of a constitutional throne, August 2, 1830. Insurrectionary movements were made, a demand for a more liberal suffrage, ensued in the streets of Paris in February, 1848; and the "citizen king" fled with a few adherents, and the guard could not be expected to support him. On February 24th Louis Philippe, deserted by his courtiers, fled to the coast, and was taken by a queen, concealed himself for some days, and at length found opportunity of escaping in a British steamboat, to Netherlands, where he died at Mr. Smith. He died at Claremont, 1850.

**Lothar**, duke of Prussia, was born in 1776, at Stolp, where his father, Duke of Mecklenburg-Strelitz, was commandant. He was married to the crown prince of Prussia, afterward Frederick William IV., and was the mother of Frederick William IV. and William III. after emperor. Died, 1810.

**Lounsbury (Lounsbury's), Thomas Baynesford**, American educator and scholar, professor of the history of 1871, and of the study of scientific school. Yale, was born at Old Saybrook, Conn., was graduated at Yale, 1859; LL.D., Yale, 1867; Harvard, 1868; LL.D., L.H.D., Lafayette, 1895, Princeton, 1896. He was engaged on the *American Cyclopædia*, 1860-61; was first lieutenant 120th Mass. Infantry, 1862-63; instructor at Yale, 1870-71. He edited *Chaucer's Parliament of Fowls*, and is the author of *Chaucer's Works*, *The Middle Ages in Chaucer*; *Shakespeare as a Dramatic Artist* and many other scholarly works.

**Low, Robert**, inventor of the Union Pacific railroad, was born in San Jacinto, Texas, 1860. He was educated in the public schools; Graduated at Louisiana State University, 1880; attorney for Houston East and West Texas railroad, 1884-89; assistant general attorney, 1889-91; general attorney, 1891-92, Texas and Pacific railroad; general counsel for Harman railroads, 1904-09; succeeded Edward H. Harman as president and chairman of board of directors, Union Pacific railroad, 1909.

**Low, A. Maurice**, journalist, author, was born in London, England, 1860. He was educated at King's College, London, and in Austria. Since 1886 he has been Washington correspondent of the *London Standard*, and is the author of *The London Morning Post*; *The Supreme Surrender*; *American Life in Town and Country*.

**Low, Seth**, American educator and publicist, mayor of New York, 1902-03, was born in Brooklyn, 1840. He was graduated at the University of 1870; LL.D., University of New York, 1900; Amherst, 1889; University of Pennsylvania, Harvard, 1891; Trinity, 1890. Mayor 1899-1900. In 1881-83, elected on independent ticket; unsuccessful candidate for mayor of Greater New York, 1897, and president of Columbia university, 1900-1901. In 1895 he erected for that institution a university library at a cost of \$1,175,000. In 1899 he was appointed by President McKinley a member of the delegation to represent the United States at the international peace conference at The Hague. He is a trustee of the Carnegie Institution, Washington.

**Lowell, Abbott Lawrence**, American educator and statesman, son of Harvard, was born at Boston, 1809, was born in Boston, Mass., 1856. He was graduated at Harvard 1877; Harvard Law School, 1880; graduated at New York University, 1881. He was lecturer at Harvard, 1879-99; professor of the sciences of government, Harvard, 1900; and president of Columbia university, 1900-1901. In 1895 he erected for that institution a university library at a cost of \$1,175,000. In 1899 he was appointed by President McKinley a member of the delegation to represent the United States at the international peace conference at The Hague. He is a trustee of the Carnegie Institution, Washington.

**Lowell, James Russell**, American poet and diplomat, was born in Boston, Mass., 1819. He was graduated at Harvard University, spent several years abroad studying languages, and, in 1855, succeeded Longfellow as professor at Harvard. LL.D., Harvard, and Cambridge, England; D.C.L., Oxford. Was United States minister to Spain, 1877-80, and ambassador to Great Britain, 1880-85. In 1860 he published *Under the Willows, and Other Poems*, and *The Cathedral*, an epic; in 1870; a collection of essays; in 1871, *My Study Window*; in 1887, *Democracy*; in 1888, *Political Economy*; *Historical and Rur*, etc. Among his poems the best known are *The Vision of Sir Launfal*, *The First Snowfall*, and *The Commencement*. He died in Cambridge, 1891.

**Lowell, Fernald**, author, astronomer, was born in New York, 1851. He was graduated at Harvard, 1876; LL.D., Amherst, 1907. He went to Japan in 1883, and lived there from time to time until 1894, when he returned to the United States, and undertook an eclipse expedition to Tripoli, 1900. He received the Janssen medal of the French Academy of Sciences, 1900. His searches on Mars, and his made discoveries on the planets, especially Mars; appointed non-resident astronomer at the Lick Observatory, Institute of Technology, Author: *Annals of the Lowell Observatory*; *The Solar System*; *Mars and Its Atmosphere*.

**Lowther (Lowthorpe), James William**, British statesman, speaker of the house of commons from 1860 to 1865, was born in 1790. He was elected to parliament for Rutland; contested Mid-Cambridgeshire, 1835; was under-secretary for the colonies, 1836; represented Rutland at international conference at Venice, 1852; chairman of committee on ways and means and deputy speaker, 1855.

**Loyola, Ignatius (Iñigo López)**, original name Inigo Lopez de Recalde, the founder of the order of the Jesuits, was descended from a noble Biscayan family, born at the castle of Loyola, in 1491, and died 1556. He was attached in his youth as a page to the court of Ferdinand and Isabella, and trained up in all the vices and frivolities peculiar to his position.

When still a young man he entered the army, and during the defence of Pamplona in 1521, against the French, he was severely wounded, and lay for some time in bed. This was the result. The only books he found to relieve its tedium were books of devotion and the lives of saints. This course of reading induced in him a religious devotion, in which he renounced the world, made a formal visit to the shrine of the Virgin at Montserrat, and vowed himself her knight.

At his own house he made pilgrimage to Rome and Jerusalem, and from 1524 to 1527 attended the schools and universities of Barcelona, Alcala, and Salamanca. In 1528 he went to Paris, where he went through seven years' course of liberal and theological training. Here in 1534 he formed the first nucleus of the society which afterwards became so famous. Francis Xavier, professor of philosophy, sciences, and letters joined with Loyola and bound themselves together to devote themselves to the care of the church and the conversions of infidels.

Rome ultimately became their headquarters, where Loyola submitted the plan of his new order to Paul III., who, under certain limitations, confirmed it in 1540. Loyola continued to reside in Rome and govern the order until 1558, when he died of his death. He was beatified in 1607 by Paul V., and canonized in 1622 by Gregory XV.

**References.**—Of the complete *Life*, the best is in the *Life of Loyola*, by the Rev. J. B. de la Motte, in French, the *Life by B. de la Motte*. See also *Duffin's Ignatius a Loyola*; *Catholic Encyclopedia*; *Loyola and the Jesuits*; *Ignatius a Loyola*; *Ignatius a Loyola*.

**Labbok (Labak), Sir John, Lord Abernethy**, English naturalist and politician, was born in London, 1831. He was educated at Eton college, then entered his father's banking house, and in 1858 became a member of parliament, where he served at intervals until elevated to the peerage in 1900, as Lord Abernethy. He is the author of *Prehistoric Times*; *The Origin of Civilization*; and *The Progress of the Human Mind*; *Fifty Years of Science*; *Placards of Life*, etc.

**Laerulus (Larulus), or Titus Laerulus**, Latin author, was born in Rome, 100 B.C., about 99 B.C. His principal work, *De Rebus Naturæ*, in six books, appeared 56 B.C., and in 100 B.C. It was a philosophical dictionary. Died about 55 B.C.

**Laetinius (Lælius), Lucius Laetinius**, celebrated Roman statesman, was born in 165 B.C. He twice defeated Tigranes of Armenia; but his legions became mutinous, and he was superseded by Pompey. He was a friend of Pompey's power, and was one of the first triumvirs, but soon withdrew from politics.

**Leini (Léni), or Luvino, Bernardino**, painter of the Lombard school, was born at Luino, about 1473. His skill was developed in the school of Leonardo da Vinci; indeed, many of his works were at one time attributed to that great artist. He is one of the five great painters whose "imprudence" Rukin affirmed died about 1533.

**Leumais (Lewm), Charles Fletcher**, American author, explorer, was born at 1828, New York. He was graduated at Harvard, 1851; Litt.D., Santa Clara College. Edited newspaper in Ohio, 1852-54. He was city editor *Los Angeles Daily Times*, 1855-57; lived five years in India; publisher of India, New Mexico, learning Indian languages and customs; traveled in the south of the United States; also in Mexico and South America; has explored entire coastland from Canada to the Gulf of Mexico; author of *The Awakening of a Nation*; *Mexico For Dummies*, etc.

**Lewis, William**, American jurist, was born at Newport, Ky., 1844. He was graduated at Cumberland University, Tennessee, 1867; at the University of Virginia, 1868. He was of the United States circuit court, 6th judicial circuit, 1863-1869, and became associate justice of the United States Supreme Court, 1900. He has been for a number of years professor of constitutional law and dean of the law department, Cumberland University.

**Luther, Martin**, great German religious reformer, was born at Eisleben, 1483, and died there 1546. At school he made rapid progress in Latin and other studies, and, in 1507, entered the University of Erfurt. Here in 1505, he received a master's degree.

About this time he discovered in the library of the university a Latin Bible, and found, to his amazement, that the translation was more than the excerpts in common use. He was destined by his father to the law, but his more intimate acquaintance with the Bible induced him to turn his attention to the study of divinity, with the view of enter-











the theory that the electric current is capable of passing through any substance, and, if started in any given direction, of following an undeviating course without need for a wire or other conductor. Soon afterward he succeeded in sending messages from Spain to a steamer fifteen kilometers distant; also in sending a message from Queen Victoria to the prince of Wales on royal yacht, 1897; came to the United States, 1899; used his method in reporting election, 1900; succeeded in establishing wireless telegraphic communication across the Atlantic ocean, 1901; daily cables were serviced by British wireless telegraph inaugurated by him on trans-Atlantic liners, 1904.

Verus, Aurelius Arminius, son of Annius Verus and Domitia Cavilla, was born at Rome, 121 A. D. His qualities attracted the notice of the emperor, and he was adopted by him in 161 A. D. Verus, but *Verissimus*, and who conferred his honors on him even while a child. When only twelve years of age he was adopted by the emperor Lucius C. Commodus, but Antoninus Pius, the successor of Hadrian; and Faustina, daughter of Pius, was selected for his wife. He was made emperor in 168 A. D. and reigned until the death of Pius, 161 A. D., he continued to discharge the duties of his various offices with the same moderation and wisdom as he had shown in the office of proconsul, and as a member of the senate and as an orator under Herodes Atticus and Cornelius Fronto, and his love of learning unreasonable. Even after he had attained to the highest dignity of the empire he continued to study the works of Sextus of Chironia. Many of letters were his most intimate friends, and he received the highest honors which could be conferred on a man. In 180 A. D. was felt to be a national calamity; he was deified, and for more than a hundred years his image was found among the household gods in the homes.

Margaret of Angoulême (d'orléans), queen of Navarre, and daughter of Charles of Orleans, was born in 1492. In 1527 she was married to Henri d'Albret, king of Navarre, to whom she bore a son, who died in infancy, and a daughter, Jeanne d'Albret, mother of the great French monarch, Henry IV. She encouraged agriculture, the arts, and learning, and to a certain extent embraced the cause of the reformation. She died at Odoon, 1549.

**Margaret of Anjou** (mā'shō), daughter of René of Anjou, was born in 1430. In 1445 she was married to Henry VI. of England. In the wars of the Roses, Margaret, after a brave struggle of nearly twenty years, was finally defeated at Tewkesbury in 1471, and was kept in the Tower four years, until ransomed by Louis XI. She then retired to France, and died at the castle of Dampierre near Saumur, 1482.

**Margaret of Austria**, daughter of the emperor Maximilian and Mary of Burgundy, was born at Ghent, Belgium, 1480. She married first John of Castile, and second Philibert of Savoy; was made governor of the Netherlands in 1507, and negotiated both the league of Cambria, in 1508, and the "pair des dames," in 1529. She died at Mechlin, Belgium, 1530.

**Margaret of Denmark**, daughter of Waldemar IV. of Denmark, was born in 1353. She succeeded

her father, became queen also of Norway on the death of her husband, Hakon VIII., but was soon expelled. She recovered Norway in 1387 and, having defeated Albert of Mecklenburg in 1389, united the three Scandinavian kingdoms by the union of Kalmar in 1397. Died 1412.

**Maria Christina**, ex-queen-dowager of Spain, was born at Naples, 1806, daughter of Francis I., king of the Two Sicilies. In 1829 she became the fourth wife of Ferdinand VII. of Spain. In 1834 a revolution expelled her from the country, and she took refuge in France, but returned to Spain in 1864, only to retire again in 1868. Died 1878.

In 1804, only to retire again in 1806. In 1802, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2

**Mariana** (má'ré-d'na), **Juan**, Spanish historian was born in 1536. He was a Jesuit, taught theology in Rome, Seily, and Paris, and finally lived in retirement in Toledo. In 1609 he published at Cologne *Seven Theological and Historic Treatises*, two of which were censured by the (41)

inquisition, and the author was subjected to imprisonment and penance. His chief work is his *History of Spain*, which extends to the accession of Charles V. with a summary of later events down to 1621. He died in 1623.

[illegible]

**Marie de' Medici** (mā'rē' də mād'dē-sī), queen of France, daughter of Francis of Tuscany, was born in 1573. She married Henry IV. of France in 1600, and became the mother of Louis XIII., during whose minority she was regent. She was overthrown by Richelieu after a long contest, and left France in 1631. Died, 1642.

**Mario** (*né-tro-é*). **Giuseppe**, famous Italian opera-singer, was born at Cagliari, Italy, 1810, son of General di Candia. In 1835 he made his first appearance in opera as Robert in *Robert le Diable*. In this he achieved the first of many successes in Paris, London, St. Petersburg, and America. Mario married the famous singer, Giulia Grisi, and retired from the stage in 1867. Died, 1883.

**Marion, Francis**, American general and patriot, was born near Georgetown, S. C. 1732. He

received a scanty education, and, after a trial of seafaring life, in which he was wrecked and with difficulty rescued, engaged in farming. His first active service was in Charleston harbor, and later in the defense of Fort Moultrie, 1776. He was present at the battle of the Clouds, 1780, and was a member of several companies of volunteers among the country lads, or "cowboys" as the British called them, and with this force marched to the relief of General Gates, at that time in North Carolina. Among the most noted engagements in which he took part were the battles of the Clouds, 1780, and of Parker's Ferry, and Eutaw. At the close of the war Marion resumed his former occupation, and

remained a his plantation until his death, 1795.  
**Marion Harland.** See Terhune, Mary V.  
**Marius** (mă'ri-us), Calus, Roman general, was  
 born near Arpinum, 157 B. C. He served with  
 distinction at Numantia under the younger Scipio  
 Africanus, and in 119 was tribune of the plebs.  
 Meanwhile an immense horde of Cimhri and Teu-

tons had burst into Gaul, and repeatedly defeated the Roman forces. Marius, consul for the second, third, fourth, and fifth times, 104-101, annihilated them after two years' fighting in a terrible two days' battle near Aix, in Provence, where 100,000 Teutons were slain. Marius was declared the saviour of the state, the third founder of Rome, and was made consul for the sixth time in 100. Marius and Cinna were elected consuls for the year 86, but Marius died a fortnight afterward.

**Mark, Edward Laurens**, American naturalist and educator, professor of anatomy, Harvard, was born at Hamlet, Chautauque county, N. Y., 1847. He was graduated at the University of Michigan, 1871; Ph.D., University of Leipzig, Germany, 1876; LL.D., University of Michigan, 1897. University of Wisconsin, 1904. Hersey professor of anatomy since 1885, director of zoological laboratory since 1890. *See* *Biographical Dictionary of the History of Science*.

laboratory since 1900, Harvard University.  
**Markham, Edwin**, American poet, writer, lecturer, was born in Oregon city, Ore., 1852. He went to California, 1857, worked at farming, blacksmithing, herded cattle and sheep during his boyhood, and earned his way through the common school. He has written poems, since early boyhood, for California papers and received recognition of best Eastern magazines; was principal and superintendent of schools in California until 1899. Author: *The Men with the Hoe, and Other Poems*; *Lincoln, and Other Poems*;

**Marlborough, John Churchill**, first Duke of Marlborough and diplomat, was born in 1650. He obtained a commission, through the influence of his sister, with the duke of York, and first served under Turenne; defeated James II. He received the title of Marlborough created a commander-in-chief by William III., intrusted with his former master; was appointed captain-general and duke under Queen Anne, and won the victories of Blenheim, 1704, Ramillies, 1706, Oudenarde, 1708, and Malplaquet, 1709. He died in 1722. He was dismissed on a charge of peculation. Died, 1722.

**Marlowe, Christopher**, British dramatic writer, was born about 1564. He belonged to the genera-

tion immediately preceding that of Shakespeare and is considered by many to be second only to

Shakespeare among the dramatists of the time. His chief plays are: *Tomerlane the Great*; *The Tragical History of Dr. Faustus*, to which Goethe acknowledged his obligations; *The Jew of Malta*; and *Edward the Second*. He died in a tavern brawl at the age of twenty-nine, in 1593.

**Marlowe, Julia**. American actress. 1885. b. England, in the village of Caldbreck, Cumberlandshire, 1870. She came to the United States with her mother and sister in 1885, and after two years; moved to Ohio, locating finally in Cincinnati; attended public schools until her twelfth year, then joined juvenile opera company, where she sang, danced, and acted, and in other light opera. She then retired from the stage and studied three years in New York; made her metropolitan debut as *Yarbenia* in *Ingomar*, with the Grand Opera Company, in 1895. She played other tragic and romantic roles throughout the United States and Europe. She married Robert Taylor, a headliner of the same company, but afterward secured legal separation.

**Marmontel** (*mār'môn'tel'*), Jean François, French writer, was born at Bort, 1723. He wrote *Les Incas*; *Bélésaire*, and *Contes Moraux*, and made his way into Parisian society by gentleness, wit, and a dainty and candid literary power. He was elected to the French Academy in 1763, and was a literary disciple of Voltaire. Died, 1799.

**Mateo de Vilanova**, Clément noted French poet, was born at Cahors about 1405. He entered the service of Princess Margaret, afterward queen of Navarre. He made many enemies by his witty satires, and in 1534 fled first to the court of the queen of Navarre, and later to that of the duchess of Ferrara. He returned to Lyons in 1460, and in 1538 began to translate the poems which the French dress and sing to secular airs, helped to make the new views fashionable. His poems consist of elegies, epistles, rondeaux, ballads, sonnets, madrigals, epigrams, nonance verses, and longer pieces. His special gift lay in badinage and gracefully naïve.

**Marquette** (*mar'ket*). Jacques, French Jesuit missionary and American explorer, was born at Laon, France, 1637. He founded Sault Ste. Marie and Keweenaw missions; accompanied Joliet in his exploration of the Mississippi, and died while attempting to establish a mission among the Illinois Indians. 1675.

**Marryat** (mar'-at), Frederick, English author, was born in Westminster, 1792. He served in the navy for many years, becoming a post captain, and wrote many novels, including: *Frank Mildmay*; *Middlemarch*; *East*; *Peter Simple*; *Snarles*; *...*

may; *Businessman Easy*; *Enter Simple*; *Charlie, you*; *The Little Savage*; and *Valerie*. He also published a *Code of Signals for Vessels Employed in the Merchant Service*, adopted in England and other countries, and *Diary in America*, in 6 volumes.

**Marsh, George Perkins**, American diplomat and philologist, was born at Woodstock, Vt., 1801. He studied law, was elected to congress in 1842, was United States minister to Turkey, 1849-53, and to Italy, 1861-82. He was made LL. D. by Harvard in 1859. He died at Vallombrosa in Italy, 1882.

**Marshall, Alfred**, English economist, was born in London, 1842. He was educated at Merchant Taylors and St. John's, Cambridge; D.Sc., Oxford and Cambridge; honorary LL.D., Edinburgh; hon. Dr. juris., Cracow University; professor of political economy, Cambridge University, 1885-1908; member of royal commission on labor, 1891; vice-president of the royal economic society; fellow of the British Academy, 1902, and member correspondent de l'Institut de France, 1908. Author: *Economics of Industry*; *Curriculum in Economics*, etc.

**Marshall, Henry Rutgers**, American architect and author, was born in New York, 1852. He was graduated at Columbia in 1873; L. H. D., Rutgers, 1904; in practice as architect since 1878. Fain, *Pleasure, and Aesthetics; Aesthetic Principles; Instinct and Reason*, etc. He is a contributor to art, psychological and philosophical journals and literary magazines and reviews, and was the principal speaker on aesthetics at the congress of arts and sciences, St. Louis exposition.

**Marshall, John**, American jurist, chief-justice of the United States, was born in Fauquier county, Va., in 1733. He was educated at the College of William and Mary, where his legal studies were interrupted by the revolution, in which he served under his father, Colonel John Marshall. He was admitted to the bar in 1778. In 1781 he began to practice law in Fauquier county, Va. He was sent to France with Pinckney as an envoy in 1793. In 1795 he was ordered to leave the country when he had declined Talleyrand's request for a loan. In 1799 he was elected to the U. S. House of Representatives as secretary of state. He was made chief-justice of the Supreme Court in 1801 by John Adams, and held this position until his death, which occurred at Philadelphia, Pa., 1835. His name is associated with the landmark case of the supreme court for thirty-four years, during which his decisions on constitutional questions were generally accepted as authoritative. The constitution that have been accepted ever

**Martel, Charles.** See Charles Martel.



**Maximilian I.**, German emperor, was born in 1459, son of Frederick III. In his nineteenth year he married Maria, only child and heiress of Charles the Bold, duke of Burgundy, and was soon involved in a war with Louis XI. of France, who attempted to seize some of her possessions. Subsequently he married the daughter of the duke of Milan, and although inclined to peace, he became involved in wars with the Swiss, the Venetians, and the French. Died 1519.

**Maximilian, Emperor of Austria and Mexico.** Maximilian Joseph, Archduke of Austria, and emperor of Mexico, was born in Vienna, 1832. He was the brother of the present emperor of Austria-Hungary. In 1853 Napoleon III. had it in mind to conquer Mexico and set up an empire, and he offered the crown to Maximilian, who went to Mexico in 1864. But he pleased no one, and in 1866, when the French troops left the country, the empire fell to the Mexicans. Maximilian then made a desperate effort for his own defense, but he was captured by the republicans, and, after a trial, shot near Queretaro, in his thirty-fifth year, 1867.

**Max O'Rell.** See Blouet, Paul.

**Maxwell, James Clerk**, British physicist, was born at Edinburgh, 1831. He was educated at the University of Edinburgh. In the great work of his life, *Electricity and Magnetism*, 2 volumes, he constructed a theory of electricity in which "action at a distance" should have no place. He was the first to make correlation the subject of actual measurement. But he was best known to the public by his investigations on the kinetic theory of gases. In 1879 he edited Cavendish's *Electrical Researches*, and died in the same year.

**Maxwell, William Henry**, American educator, superintendent of schools of Greater New York since 1898, was born at Stewartstown, Ireland, 1852. He was educated at royal academical institution, Belfast, and Queen's College, Galway and Belfast. He was teacher in the public schools, Brooklyn, N. Y., 1880-82; assistant superintendent of schools, Brooklyn, N. Y., 1882-87, and superintendent, 1887-98. He is author of a series of text-books on English grammar and composition.

**May, Sir Thomas Erskine**, English jurist and writer, was born in London, 1815. He was educated at Bedford school. He was created successively C. B. and K. C. B., and was on his retirement, in 1886, created Baron Farnborough. His *Treatises on the Law, Privileges, Proceedings, and Usage of Parliament* has been translated into various languages; his *Constitutional History of England 1760-1860* is a continuation of Hallam; and his *Democracy in Europe* shows great learning and impartiality. He died in 1886.

**Mayer, Henry** ("Hy Mayer"), caricaturist, was born at Worms-on-Rhine, 1808. He was educated in England and Germany, and came to the United States, 1886. He began his career as an artist in Cincinnati, 1887, and has resided in New York since 1893. He has been illustrator for *Florescent Blazette*; *Figaro Illustré*; *Le Rire*; *Pall-Mall Magazine*; *Punch*; *Life*; *New York Times*, *Herald*, etc. Author: *Autobiography of a Monkey*; *A Trip to Twend*; *Alphabet of Little People*, etc.

**Mazarin** (*ma-zo-ran'*), Jules, cardinal and chief minister of France during the minority of Louis XIV., was born at Rome, 1602. Having accompanied a papal legate to the court of France, he became acquainted with Richelieu, and his later career perceived his great political talents, and engaged him to maintain the French interests in Italy, which he did while still employed by the pope as vice-legate at Avignon. In 1642, as nuncio to the French court, he was appointed ambassador of France among the nations as increased, and in the internal government of the country those principles of despotism were established on which Louis XIV. afterward acted. The administration of justice, however, became very corrupt, and the commerce and manufactures of the country sunk into deep depression. Died, 1661.

**Maximil** (*max'ul-né*), **Guisepp**, Italian patriot and revolutionist, was born at Genoa, 1805. The organization of a new liberal league, the Young Men of Italy, was his first step toward action. His first work was a newspaper, entitled "New Europe," and based on principles of European rights and enfranchisement, was inaugurated by the exertions of Massimo in Switzerland. In 1837 he quitted Switzerland, and took refuge in London. From London, he sent his labors in the Italian revolutionary cause were unceasing. After an ineffective scheme for a republican league, he ventured to enter Italy, and was arrested and confined in the fortress of San Leo. A prisoner until Rome was taken by the Italian army. On his death, 1872, the government honored him.

with a public funeral.

**Mead, Larkin Goldsmith.** American sculptor, was born at Chatham, N. H., 1835. His early education was spent in Vermont. He studied art at Brooklyn, N. Y., and in Italy. The colossal statue of "Vermont" on the dome of the state-house, and of "Ethan Allen" in the portico of the same building in Vermont, and one of the same name by the city of Vermont, are the handiwork of representatives at Washington are all his work; also, a colossal statue, "The Mississippi River"; colossal marble group representing Columbus appealing to Isabella, Sacramento, Cal., and such redemptive traits in the Henry James, William D. Howells, and John Hay.

**Mead, George Gordon**, American general, was born in Cadix, Spain, where his father was an agent of the United States navy, 1815. He was educated at the United States Military Academy at West Point, New York, and served one year in the army, resigned to begin practice as a lawyer in 1839. He was called to the bar in 1841, and in 1842 he was placed in command of a brigade of volunteers, soon rose to the command of a division, and in 1846 was appointed to command the army of the Potomac. At Chancellorsville he commanded the first corps, and when Hooker's army was defeated at Gettysburg, the army itself was in hasty movement northward to check Lee's invasion of the North in 1863. Meade's army was defeated at Gettysburg, and he, with the greatest reluctance, and altogether from a sense of duty. He had inclined to fight on the defensive, but he was overruled by the army. He then followed Lee's army, and on September 30, 1863, he was defeated at the battle of Red Bank. He was then called to the aid of the army, and he was made major-general in the regular army, and commanded the military division of the Atlantic at the time of his death at Philadelphia, 1872.

**Lorenzo de' Medici** (né *di*), **Lorenzo de'**, nicknamed "the Magnificent" (1469-1492), was the second son of the ruler of an illustrious Florentine family, which for centuries exerted great influence in Italy and in Europe. He was born on April 8, 1469, in the Palazzo Medici, and his brother Giuliano, by the Passi, another distinguished family of Florence, who were Italian monarchs, was elected pope in 1523, as Clement VII, archbishop of Pisa. He resulted that Giuliano was named and Lorenzo wounded; whereas Giuliano was killed, Lorenzo was spared. He wore an archiepiscopal robe, and Giacomio de Passi, with one of his nephews, shared the same fate. He was a member of the Medici family, which was the ruling family of Florence, had an interdict upon the city territory, and forming a league with the king of France, the king of Spain, and the king of the dominions. Hostilities followed, and were carried on with great vigor, and the city was besieged. The remainder of Lorenzo's administration was unmarked by any great public events; but his private life was distinguished by his extraordinary attention he paid to the augmentation of the Laurentian library, which had been

**Meissonier** (*mei'son'ay*). **Jean Louis Ernest**, French painter, was born in Lyons, 1815. He was a pupil of Cogniet, and became a member of the Beaux Arts in 1861. His best pictures distinguished for minute detail are probably the "Napoleon Cycle," among which the picture called "1814" was sold, in 1887, for the highest price ever obtained during an artist's lifetime, \$170,000. He served in the Italian campaign and the early part of the Franco-Prussian war, and was colonel

Meibach, (mairch'-bach), Philip, Luther's fellow-laborer in the reformation, was born at Eisleben in the principality of the Rhine, in 1493. In 1521 he published his famous treatise, *Theologia Germanica*, the first great Protestant work. He was a zealous and devoted worker, and an important contribution to the cause of Protestantism in the Augsburg confession. After Luther's death he continued his work, and was one of the some of the Protestants, by whose concessions to the Roman Catholics which his anxiety for the peace of the empire induced him to make, the Reformation was preserved. He died at Meibach, Madame, nee Helen Porter Mitchell, operatic vocalist, was born in Methuen, August 18, 1862. She studied singing in Boston, and in Paris, and made her stage debut in 1887 in *Figaro*, at the theatre de la Monnaie, Brussels. Her first American tour was in 1890, when she sang in 1889 played *Ugolino* at Paris grand opera. For her Boston specially wrote *Elaine*, produced in 1891. She has since made several tours, and in recent opera seasons in London and New York, and, in 1906, proved herself equally successful in song.

**McLellan, Charles Sanger**, American railway official, was born in Lowell, Mass., 1851. He has been in the railway service since 1869, beginning as a freight conductor on the New York and New England Hampshire railroad; auditor, 1881-83, superintendent, 1883-84, general superintendent, 1884-88, Boston and Lowell and Concord railroads; assistant general manager, 1888-89, general traffic manager, 1889-90, New York Central; general manager of New York and New England railroad at Boston, 1892; second vice-president New York, New Haven and Hartford railroad, 1892-96; president of the New York, New Haven and Hartford railroad company, since 1903.

**Meng-tzu** (*Men-tsi*), **Meng-tz**, Chinese sage, was born in Shantung, about 371 B. C. He founded a school of thought known as the *Wang Yang-ming* or *Ching-tzu* Confucius. After his death his disciples collected his conversations and exhortations, and published them as the *Book of Meng-tzu*. The philosophy root of his system is belief in the ethical goodness of man's nature. He is liberal and tolerant, and he is a firm political economist. He advocated freedom of trade, the deposition of unworthy rulers, division of labor, inspection of work by government, maintenance of good roads and bridges, poor-laws, education, and the abolition of war. His teachings and sayings are based on his writings. Died about 287 B. C.

**Mendelssohn-Bartholdy** (men'dei-sön bar'töl'dē'), Felix, German composer, was born at Hamburg, 1809. In 1835 he accepted the directorship of the Leipzig concerts. Here he was in the center of the musical world of Germany, and was stimulated to his highest and most brilliant efforts. His oratorios, *Paul and Peter*, are his two greatest works, the latter second only to the greatest works of Handel. He died at Leipzig, 1847.

**Wengels (Wengels).** Anton Raphael, modern German artist, was born in Augsburg, Bohemia, 1728. From his sixth year he was compelled to exercise himself in drawing daily and hourly, and a few years later was instructed by his father in oil, miniature, and enamel painting. In 1761 Charles III. invited him to Spain, where his principal works at this time were an *Assembly of the Gods*, and *Descent from the Cross*. In 1776 he returned once more to Rome where he died in 1779.

**Menzies, Alan Wilfrid Granbrook**, 1877; professor, was born in Edinburgh, Scotland, 1877; M. A., Edinburgh, 1907; B. Sc., 1898; studied at Leipzig and Aberdeen; Ph.D., 1886; Chicago, 1910; D.Sc., 1912; Glasgow, 1913; F.R.S.E., 1914; University College, Edinburgh, 1898-1901; professor of chemistry, Bt. Muogo's College, Glasgow, 1902-08; secretary Medical Faculty, 1907-08; research assistant, instructor, Chicago University, since 1908. Fellow of the Society of Chemical Industry.

**Brevitiveness of a Thermoregulator; Phosphoric Acid Hydrates; Molecular Weight Determination of Dissolved Substances; New Methods for Measuring Critical Temperatures; The Influence of Temperature on Solubility; Vaporization Apparatus; Composition of Calomel Vapor; Calomel and Alkali's Anomaly; Critical Temperature of Mercury; Calculation of Critical Temperatures; Physical Constants Formulas; The Influence of the Coefficient of Expansion on High Temperature Ovens, etc.**

**Mercator** (mër-ka'tör), Gerardus, Flemish geographer of the sixteenth century, was born at Rupelmonde, Flanders, 1512, his real name being "merchante," "merchant," of which Mercator is the Latinized form. He took his degree as bachelor of philosophy at Louvain, but devoted his later years to the study of geography. He published several important works, including maps and a description of France, Germany, and Great Britain. Some of his later works were of a religious character and were supposed to favor the Catholic cause. Died Dec. 21, 1594.

**Heredia, George**, English poet and novelist, a leader of the Symbolist movement in England. He was studying for some time in Germany he commenced his literary career with the publication of a volume of poems. This was followed by the *Shaving of Shagpat*, an Arabian entertainment; *Parina*, a legend of the East; *Reveries*, a collection of poems; *The English of England*; *Enitha in England*; *Rhoda Fleming*; *Vittoria*; *Benusomph's Career*; *Daughters of the Crossways*; *A Reading of Earth*; *One of Our Conquerors*; *Empty Purses*; *Jump to Glory Jane*; *The Conqueror's Marriage*; *The House on the Beach*; *Comes and Goes*; *One of the Comets*; *Spirits*; *Selected Poems*, etc. Died, 1909.

**Wredth, Owen**, See **Lytton, Edward Robert**, **Earl of**.

**Sergenthaler** (*ser'gen-dal'er*). **Ottmar**, inventor of the typesetting machine bearing his name, was born in Wurtemberg, Germany, in 1812. He came to the United States in 1872, and received a government position in Washington, D. C., to care for the mechanism of bells, clocks, and signal service apparatus. He died in Baltimore, Md., 1899.

**Ariste** (a'ri'stè'), **Prosper**. French novelist, historian and archaeologist. Born at Paris, 1803. After a failed anonymous effort, wrote *Clara Garsul*, and *La Garza*, Spanish comedy, and *Illyrian songs*; *La Chénante*, a *Requiem*; *Chénante IX*, his most famous work; *Le Capitaine*; *Calabaz*; *Caenen*; *Tamara*. He became a member of the French academy in 1844, was made a senator in 1853, president of the commission for reorganizing the bibliothèque impériale in 1858, and commander of the legion of honor, 1860. Died at Cannes 1870.

**derivate** (muri-nul), **Charles**, English historian, dean of Ely, was born in Exeter, 1808. He was graduated at Cambridge. He wrote a history of Rome from its foundation in 753 to the fall of Augustus in 476, but his chief work is the *History of the Romans under the Empire*, indispensable as an introduction to Gibbon. Died, 1893.

**Verre d'Aubigne** (*verre d'Artois*). **Jean Henri**, ecclesiastical historian, was born near Geneva, Switzerland, 1794. In 1823 he was appointed court preacher at Brussels, but after the revolution of 1830 he declined the post of tutor to the prince of Orange; returning to Geneva, he took part in the institution of the new Evangelical College, and filled its chair of church history until his sudden death in 1872. His *History of the Reformation in the 16th Century* has enjoyed immense popularity.

educator, was born at Auburn, Me., 1854. He was graduated at the Maine State University, B. S., 1879; Ph. D.; professor of geology and mineralogy, George Washington University, since 1893. Author: *Stones for Building and Decoration*.















Quaker school at Philadelphia. At first in a New York counting-house, he studied law, and was admitted to the bar; but during the revolutionary war he was arrested by the British. From 1785 he was crippled by a fever. In 1787 he published his *Power of Religion on the Mind*. His *English Grammar* (1789) was widely read and loved by English scholars, an English reader, etc. Died, 1826.

**Musset (mü'set'), Louis Charles Alfred de**, French poet, was born in 1810. In 1828 he received a prize for a Latin dissertation. His *Reveries* (1829) and *Novels* (1830) were popular, and his *Nuits*, which are regarded as his finest lyrics. He was librarian in the ministry of the Interior for several years before 1848, and was restored to his office in 1852, with the title of reader to the emperor. His complete works appeared in ten volumes in 1866. Died, 1907.

**Mutsuhito (mut'wō-hi'tō)**, emperor of Japan, was born in 1853, ascended the throne in 1867, and married Princess Haruko in 1869. His reign has been marked by great reforms. Under the title of the present emperor, Japan has entered upon an unprecedented era of prosperity. Civilization has made rapid progress, and the introduction of western arts and ideas has secured for Japan the foremost place among Asiatic nations.

**Myers, Philip Van Ness**, author, historian, was born at Tribes Hill, N. Y., 1840. He was graduated at Williams College, 1862. He was president of the Farmer's College, Ohio, 1879-90; professor of history at the University of Cincinnati, 1890-1900; dean academic faculty, University of Cincinnati, 1890-97. Author: *Life and Times of George Washington*; *Remains of Lost Empires*; *Ancient History*; *Medieval and Modern History*; *General History*, etc.

**Nesbit, Herbert**, English novelist, was born at Arlington, Mass., 1860. He was graduated at the Massachusetts Agricultural College, Amherst, Mass., 1882. He is now president and editor of Phelps publishing company; director of *Good Housekeeping* since 1901; was vice-president of the Orange Judd company and editor of *American Agriculturist* at New York, and *Orange Judd Farmer* at Chicago, 1888-1894; president, editor, and manager of *Orange Judd* company, New York, since 1891.

**Nadir Shah (nā'dir shāh)**, Persian ruler, belonging to the Afshars, a Turkish tribe, was born near Herat, in Khorasan, Persia, in 1748. He was degraded and punished for some real or supposed offense, he betook himself to a lawless life, and in a few years was the head of a band of 8,000 robbers, who levied contributions from almost the whole of Khorasan. He invaded India, took Delhi in 1739, and seized the throne of diamond and the peacock throne. His last years were marked by rapacity and oppression, and he died at last under the hands of his subjects in 1747. He is still reckoned by the Persians, however, as one of their great national heroes.

**Nesbit, Charles**, lawyer, editor of commerce and labor since 1909, was born in Colorado county, Texas, 1849. He was graduated from the St. Louis Law School in 1872, and was admitted to the bar in 1873. President of the St. Louis city council from 1892 to 1895, and was a member of the St. Louis Law School faculty since 1896. He has taken an active part in politics for the last twenty years, and has delivered addresses before bar associations and similar organizations at various times of public interest.

**Nansen (nā'sen), Fridtjof**, Arctic explorer, was born in Norway, 1861, and was graduated from the University of Christiania, Ph.D., 1888. He started on his first Arctic expedition in 1882, and in May of the same year he and his companions celebrated journey across Greenland, which he accomplished in forty-six days. In 1893 Nansen sailed in the *Fram* to the Arctic Ocean, and explored entire polar regions, and penetrated farther north than any of his predecessors. He then became professor of zoology at Christiania University; took an active part in the separation of Norway and Sweden in 1905, was minister for Norway at the court of St. James in 1906-07, and at the court of oceanography, Christiania University, since 1908. Author: *Polarized North*; *Scientific Results*; *Arctic and the Arctic*; etc.

**Napier (nā'pīr; nā-pēr'), Sir Charles**, British admiral, was born at Merchiston ball near Falkirk, 1760, cousin to the hero of Sin. Commanding the *Flammar* in 1811, he defeated the *Flammar* upon the enemy in the Mediterranean. In 1814 he led the way in the ascent of the Potomac and took part in the battle of Blenheim. He also commanded the Baltic fleet in the Russian war; but the capture of Bomarsund failed to realize expectations, and he was dismissed from the sea in the British parliament, and until his death at his Hampshire seat, Merchiston ball, in 1860, he labored to reform the naval administration.

**Napier, Sir Charles James**, British general, the conqueror of Sind, was born at London, 1782. He served during the Indian war, and at the battle of Corunna was five times wounded and taken prisoner. He also took part in the Anglo-American war of 1812. He died in 1827, and was governor of Cephalonia, in 1838, and K. C. B., and

in 1841 was sent to India to command the army of Bombay against the Amers of Sind. Here he destroyed the fortifications of Eman Ghar, 1842, India, by the battle of Meeanee (Meeanee), where, with 2,800 English and Sepoys, he defeated 22,000 Baluchis. After the annexation he was appointed governor of Sind. He died near Portsmouth, 1853.

**Napier (nā'pīr), John**, Scottish mathematician, was born at Merchiston ball near Edinburgh, in 1550. He made a contract with Logan of Restarick for the discovery of iron mines in the East of Scotland, and he was employed for defense against Philip of Spain, and recommended him as a fertilizer of land. He applied his famous logarithmic tables in *Horologium Logarithmicum Canonis Descriptio*, in 1614, and the calculating apparatus called "Napier's bones" in *Arithmetice Universalis per Virgulas libri duo*, 1617. Died at Merchiston, 1617.

**Napier of Magdala, Robert Corneil Napier, Lord**, British general, was born at Colombo, Ceylon, 1810. During the Indian mutiny he was chief engineer to Sir Colin Campbell's army, distinguished himself at the siege of Lucknow, and was made K. C. B. He received the thanks of parliament for his services in the Chinese war of 1858. In 1870 he became commander-in-chief in India and a member of the Indian council, and was afterwards commander-in-chief of the field-marshal, and countess of the Tower. He died in 1890, and was buried in St. Paul's.

**Napoleon Bonaparte**, French emperor, the brother of Sir Charles, was born near Dublin, 1768. He served in the peninsular campaign and retired to St. Helena in 1815. He wrote *History of the War in the Peninsula*, *The Campaign of Austerlitz*, and *The Life of Sir Charles Napier*, London, 1860.

**Napoleon I., (Napoleon Bonaparte)**, emperor of the French, was born at Ajaccio, 1769. He was, at the age of eleven sent to the military school of Brienne, in Champagne, and in 1784, to the military school of Paris.

In 1785 he was appointed junior lieutenant in the army. He was in Paris on June 20, 1792, and saw the mob invade the Tuilleries. He also witnessed the overthrow of the monarchy on August 10. In 1793 he took a leading part in ousting the English from Toulon, and in 1794 was appointed general of the army of the army of Italy, and drove back the Sardinians.

He was married to Josephine Beauharnais in 1796, and two days later left to assume command of the army of Italy. He first overthrew the Austrians and Sardinians at Millesimo and Dego, and forced the Sardinians to make the armistice of Cherasco. He then turned against the Austrians, and after a severe struggle at the bridge of Lodi, he drove across the Adda. Then ensued the celebrated fights for Mantua—Castiglione, Arcola, and Rivoli. Mantua fell on January 16, 1797, and the Emperor Francis II. agreed to preliminaries of peace at Leoben. Bonaparte had already organized Lombardy as a republic, and had forced the pope to make the peace of Tolentino.

On his return to Paris Bonaparte obtained leave of the directory to attempt the conquest of Egypt, which was meant to be the prelude to the restoration of the French supremacy in India. Sailing from Toulon, 1798, he captured Malta, and landed in Egypt. On July 2 he captured Alexandria, on July 21, the French won the battle of the Pyramids, and the conquest of Egypt was effected. But Nelson's victory on August 1 in the battle of the Nile (Aboukir) was a bitter reverse, destroying his fleet.

In 1799 he invaded Syria, but failed to take Acre, which was defended by Sir Sidney Smith's squadron. Here he massacred 2,500 prisoners at Jaffa, and returned to Egypt, where he defeated the Turks in the battle of Heliopolis. He was elected consul of the second coalition in Europe, of the French loss of Italy, and of the state of France, he left Kober in command in Egypt, and returned to his native land on the evening of November 9, 1799, arranged by Sicily followed, and the consulate was established.

Austria and England were now the chief foes of France. Early in 1800, Bonaparte crossed the Great St. Bernard, and on June 14 won the great battle of Marengo. On December 3, Moreau won the battle of Hohenlinden, and on February 9, 1801, the treaty of Lunéville was signed. The terms were in the main the same as those of Campo-Formio. On

March 27, 1802, the peace of Amiens was signed with Britain; on August 1 Bonaparte was proclaimed consul for life. The concordat with the pope had already been signed, and Napoleon, as he was henceforth called, had to the end of 1803, however, Napoleon made preparations for a fresh development in foreign policy. He proposed to found one colonial empire in the New World, and another in India. But his schemes with regard to America were frustrated when fever destroyed his army in Haiti in 1803. In the same year he sold the territory of Louisiana to the United States for \$15,000,000.

He then determined to rearrange the map of Germany and to destroy British commerce. Early in June, 1802, he became President of the Italian republics, and in September and October he annexed Piedmont, Parma, and Piacenza. In February, 1803, he reconstituted Switzerland, and sent secret agents to stir up rebellion in Ireland. Further, he refused to desist from his British evacuation of Malta. On May 18, 1803, war between France and England broke out, and Napoleon was occupied by French troops.

The victory of Austerlitz, by Georges Cadoudal strengthened Napoleon's position, and on May 18, 1804, he became emperor of the French. Then he made elaborate preparations at Boulogne for conveying troops across the channel and capturing London. In 1805 he incorporated the Ligurian Republic with France, and forced Naples to make a treaty. But the defeat of Vienna, and the capture of the British in July destroyed all chance of a successful invasion of England, and in September he invaded Germany.

The call of Ulm opened the way to Vienna; and though Napoleon's victory at Trafalgar, on October 21, destroyed the Spanish and French fleets, Napoleon defeated the Austrians and Russians on December 2 at Austerlitz, and in 1805 he defeated the British at the battle of the Nile. He then forced Francis II. to make the treaty of Pressburg, Austria being humbled and deprived of much territory, an opportunity was given Napoleon of forming a new confederation of the Rhine. Austria, Prussia, Bavaria, Hesse-Darmstadt, and other states placed themselves under Napoleon's protection. The Holy Roman Empire ceased to exist, and on August 5, 1806, the Emperor Francis II. formally renounced his title of German Emperor.

Prussia, however, declared war on October 1, 1806; on the 14th of the same month her army was totally defeated at Jena. On the 25th the French occupied Berlin. England and Russia were alone left unruined. Against the former Napoleon issued the famous Berlin decree on November 21, 1806, and at the same time prepared to attack the Russians. In February, 1807, he fought the battle of Eylau, and on June 15 he won a decisive victory at Friedland. In July the Czar Alexander and Napoleon signed the treaties of Tilsit, which enabled them to dominate Europe. In October, 1807, France and Spain agreed to conquer Portugal, and in November Napoleon entered Lisbon. No sooner had Napoleon made Joseph Bonaparte king of Spain (June, 1808) than the Spanish people rose, and an English expedition landed in Portugal (August), and Wellington won the battle of Vitoria. The Czar Alexander proved one of the principal causes of the fall of Napoleon. War with Austria again broke out in April, 1809; but after the battles of Aspern and Wagram, the Emperor Francis was forced to sign the humiliating treaty of Vienna (Schönbrunn) October, 1809.

In seeking to strengthen his position, Napoleon was led to divorce Josephine, and in 1810 to marry Marie Louise of Austria. At the same time he made almost superhuman efforts to ruin England by means of his continental system. But on December 31, 1810, the crisis came; for he intended to modify his adherence to the continental system, and Napoleon resolved to invade Russia. His

army was defeated at Borodino, and he was forced to retreat.

dinastous campaign to Moscow in 1812, undertaken while he had the Spanish War on his hands, emperor of France during the spring of 1814, Napoleon was forced to abdicate in April, and Louis XVIII. entered Paris. After a short sojourn in Elba, Napoleon escaped to the island of St. Helena in March 2, 1815, and his reign of a hundred days began. The battle of Waterloo (June 18) completed the downfall of his hopes and he ended his days on the Island of St. Helena.

That Napoleon often showed himself in his earlier days kind, generous, and affectionate is undoubted; that he was patient during his last captivity is equally true. His temperament was Italian, his passionate feelings Corsican, but he was by nature neither blood-thirsty nor cruel. The code Napoleon withdrew to the battlefield, and he was a statesman; while, as Marbot tells us, the soldier who understands Napoleon's strategy has nothing more to learn. He waged war on a scale never before witnessed, and neither France nor any other country has produced a greater military genius. His body was conveyed to France in 1840, and laid in the Hotel des Invalides in Paris.

**References.**—Fourier's *Napoleon*; *Real's Life of Napoleon I.*; *Blount's Life of Napoleon Bonaparte*; *Russell's Napoleon: the Last Phase*; *Lecky's The History of England*; *The First Booby's A Short Life of Napoleon*; *Lecky's Napoleon in Time*; and *Browning's Napoleon: the First Phase*.

**Napoleon III., or Charles Louis Napoleon Bonaparte**, emperor of the French, was born in the palace of the Tuilleries, Paris, 1808. In 1830, he took part in a revolution which overthrew Louis XVIII. and in 1836 entered France, but, seeking to arouse the soldiery at Strasbourg in his favor, he was taken prisoner and sent to the United States. In 1840 he landed at Boulogne, again hoping to arouse the French soldiery in his favor; for his second attempt he was taken prisoner and taken to the chamber of peers, and received a sentence of perpetual imprisonment in the castle of Ham. In 1846 he was released, and the disguise of a workman. In 1848, on the abdication of Louis Philippe, the provisional government permitted him to return to France. In June of that year he was elected to the national assembly for the department of Seine and for three other departments, and in the following December he was elected by an immense majority president of the newly-constituted republic. In December, 1852, the famous coup d'état took place, and Louis Napoleon secured his election as president for ten years; but a year later he again appealed to the people, and obtained an almost unanimous vote for the restoration of the empire. In 1870 the Franco-Prussian war broke out, which led to the surrender of the emperor and his army at Sedan, and to the ultimate reestablishment of the republic. He died at Chislehurst, England, 1871.

**Narces (nár'sis)**, Hyandian statesman and general, was born toward the last quarter of the fifth century. From a manual office in the imperial household at Constantinople he rose by successive steps to the post of private chamberlain to the emperor Justinian, and ultimately to that of keeper of the privy purse. In 521 he was sent to Italy in command of a body of troops. Narces took possession of Rome, and after a series of successes, fought in southern and northern Italy, and extinguished the Gothic power in that peninsula. Justinian appointed Narces earl of Italy in 533, and he resided at Ravenna until his death in 541.

**Navarro (ná-vá-ró)** Mary Anderson de, American actress, was born in Sacramento, Cal., 1859. She began her debut as Juliet in 1876, and in 1877 at Louisville, 1878. She had great success in leading legitimate roles in the United States and England until 1880, when she married and retired from the stage. She has since lived in England. Author of *A Few Memories*.

**Niederer (né-dér'er)**, Johann August Wilhelm, noted German ecclesiastical historian, was born at Göttingen, 1789, of Jewish parents, named Mendel. He received his early education at the Johanneum in Hamburg, and then took up his residence at Heidelberg University as a private student; in 1812 he was appointed professor of theology; and the following year he was called to the newly established University of Berlin as professor of church history. Here he remained until his death in 1850. The most important

work of his life was his *Universal History of the Christian Religion and Church*, in 5 volumes. **Nedžad (né-dzad')**, Mirza Asad, a commander, was a native of Crete, who settled in Anapoli during the reign of Philip, and became the ruler of the young Alexander. He died in 329 he joined Alexander in Bactria with a body of Greek mercenaries, and took part in the Indian campaign. Having been killed, his nephew, Alexander gave Nedžad the command. He left the India in November, 325, and, skirting the coast, reached Babylon in 323. His narrative is preserved in the *Indica* of Arrian.

**Nedžad-zar (né-dzad'-zar)**, king of an ancient Persia, was born about 645 B. C. In 604 B. C. he became king, took Jerusalem about 605, and made Zedekiah king as his vassal. Zedekiah refused to surrender, and Nebuchadnezzar took Jerusalem, after a terrible siege, destroyed the temple, threw down the walls of the city, and carried the people captives to Babylon. Among the captives was the Hebrew prophet Daniel, who took much about him in the book of Daniel. He died about 561 B. C.

**Necker (ná-ker)**, Jacques, French financier and statesman, was born at Geneva, 1732, and was for many years a banker at Paris. His *Adieu au Colibri*, his *Traité sur les Ceres* and *Les Indes*, and some *Essays on the Resources of France* inspired such an interest in his talent for finance that in 1776, he was appointed director of the treasury, and after a short time, comptroller-general of France. He died at Copet, Switzerland, 1804.

**Necker, Pierre**, was a French statesman, of his work his form fifteen volumes. **Necker, Pierre**, was a French statesman, of his work his form fifteen volumes.

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**Nelson, Horatio, Viscount**, famous English admiral, was born at Burnham Thorpe, Norfolk, in 1758. He served the navy from 1771 to 1779, and after voyages to the West Indies, the Arctic regions, and the East Indies, was promoted to a lieutenant in 1777. While in command of the *Boreas* on the Leeward Islands station, he involved himself in trouble through his severe and arbitrary enforcement of the navigation act against American traders. His conspicuous bravery at the engagement with the Spaniards off Cape St. Vincent in 1797 brought him to the rank of rear-admiral. In the same year he lost his right arm at Santa Cruz, and in the following year, with an inferior force, annihilated the French fleet in the bay of Aboukir, for which he was raised to the peerage as Baron Nelson, and created duke of Bronté. The king of Naples, in token of his fear of a Napoleonic invasion he kept a vigilant watch in the channel, and, on the recognition of Napoleon's power, he was crowned king. His memorable victory off Trafalgar over the French fleet commanded by Villeneuve, but was himself severely wounded at the very height of the battle, dying in 1805.

**Nelson, Knute**, lawyer, United States senator, was born in Norway, 1802. He resided in the United States in 1849, and resided in Chicago, Ill., until the fall of 1850; returned to the state of Wisconsin, and there to Minnesota, 1857. He was admitted to the bar in the spring of 1867; was a member of the assembly in the Wisconsin legislature, 1868 and 1869; member of the legislature of 1870; elected United States senator for Minnesota, 1870, and re-elected in 1901 and 1907.

**Nepertus**, Roman historian, was born probably at Verona, Italy, and flourished during the time of Julius Caesar and the first six centuries of the Christian era. He was the friend of Cicero, and his only extant work, *Vite et Illustres Imperatores*, is held in high esteem as an educational work.

**Nerast (né-rast)**, Walther, German chemist and physicist, was born at Brücken, Prussia, 1864. He studied at the University of Zürich, and at Göttingen; appointed professor of physics at Göttingen in 1901, where in 1905 he organized the institute for physical and electro-chemistry, of which he

became director in 1905. He is the inventor of the Nerast electric lamp.

**Nero, Claudius**, or **Clodius Drusus Germanicus**, Roman emperor, was born at Antium, in Latium, A.D. 37. He was adopted by the emperor Claudius, who died in 54, and he succeeded him, four years later he succeeded Claudius on the throne, which he occupied for fourteen years. His whole reign was characterized by his love of a loose, dissolute, and cruel life. The great fire in Rome happened in Nero's reign, and it is ascribed by some writers that the city was burned by Nero, and that he, who attributed the fire to the Christians, and persecuted them with the most unrelenting cruelty.

The philosopher Seneca, who had been a tutor, four miles from Rome, where he put an end to his own life on hearing the tramping of the horses on which his pursuers were pursued, 68 A. D.

**Nesselrode (né-sel'-rode)**, Karl Robert, Count, Russian diplomat, was born at Lieben, Spain, 1780, son of the Russian ambassador. He gained the confidence of Emperor Alexander, took a principal part in the negotiations which ended in the peace of Paris, and in the congress of Vienna, and was one of the most able diplomats of the holy alliance. Died, 1862.

**Nestorius** (né-s-tó-ris), celebrated heresiarch, was born in Syria. He was made patriarch of Constantinople in 428, deposed for heresy by the council of Ephesus in 431, and banished to the island of Naxos. He died there in 451.

**Netherland**, or **Netherlands**, English actress, was born in London, 1870. Daughter of Henry Netherland. She joined the Garrick theatre in 1891, and was manager of the Garrick theatre in 1891; visited Australia on a starring tour, and in the congress of Vienna, and was one of the most able diplomats of the holy alliance. Died, 1862.

**Nevada** (né-vá-da), Emma, née Emma Wixon, prima donna, was born at Austin, Tex., 1861. She studied under Mme. Marchesi, Paris; and made her debut in 1880, at the Grand Opera, London, 1880, as Amina in *La Sonnambula*. She subsequently sang here and in Europe. In 1885 she married Dr. Raymond Palmer, and now lives in Paris.

**Nevin, Ethelbert**, American composer, was born at Edgemoor, N. Y., 1859. He was educated at the University of Michigan, and taught in Boston, then went to southern Europe to study until 1900 when he returned and associated with the highest musical circles. He produced a group entitled *Water Scenes*, and a song, *The Swan*, which are perhaps his most popular compositions.

**Newcomb (né-komb)**, Simon, American astronomer and mathematician, was born in Wallace, N. S., 1835. He was educated at the University of Michigan, and graduated at Lawrence Scientific School, Harvard, 1858; L. D., Columbia, Yale, Harvard, Columbia. He was assigned to duty at United States naval observatory; professor of mathematics and astronomy, Johns Hopkins, 1884-94, and editor of *American Journal of Mathematics*. In 1874 he was made correspondent, and after 1893 was one of the eight foreign associates of the Institute of France; made officer of legion of honor of France, 1893. Author: *Solar Variations and Mutual Relations of the Orbits of the Asteroids*; *Investigations of the Orbit of Neptune*; *Researches on the Motion of the Moon*. Died, 1909.

**Newlands, Francis Griffith**, lawyer, United States senator, was born in Natchez, Miss., 1848. He was admitted to the bar in 1870, and was elected to the District of Columbia and went to San Francisco, where he entered upon the practice of law and continued the active practice until his death, until 1888. He was elected to the fifty-third, fifty-fourth, fifty-fifth, fifty-sixth, and fifty-seventh Congresses, and died in the United States Senate, Nevada, in 1903 and 1908.

**Newton, Sir Isaac**, English natural philosopher was born at Woolsthorpe, Lincolnshire, 1642. In 1665 he invented the calculus, the binomial theorem, the method of tangents, and the fluxional calculus.

The story seems to be authentic that the fall of an apple from the bough of a Woolsthorpe tree late in 1655, started the train of thought which led him to the discovery of universal gravitation. He certainly then deduced the rule of inverse squares from Kepler's third law, and he attempted to verify it by the motion of the moon. It was not, however, until 1685, when Picard's improved value for the terrestrial radius was at his disposal, and he had completed the differential calculus, that he was able to ascertain the agreement to be exact.

The great work embodying his conclusions was published in 1687, with the title *Philoso-*

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*philosophiae Naturalis Principia Mathematica*. The first book expounded generally the dynamical results of the law. The second treated of motion in a resisting medium, hydrostatics, hydrodynamics, and the theory of the tides. Finally, Book III, showed the working of the attractive principle in the solar system, and demonstrated the subjection to it of comets.

Newton's optical researches began in 1666, when he resolved white light into its constituent colors. Two years later he constructed the first reflecting telescope, and in papers communicated to the Royal Society, in 1672 and 1673, described his prismatic experiments and the phenomena of thin plates. His results were collected in a volume on *Optics*, in which the emission theory of light was advocated. Newton was made Lucasian professor of mathematics at Cambridge in 1669.

He represented the university in the convention of 1689; but though again elected to parliament in the Whig interest in 1701, he was rejected at the polls in 1705. He was knighted by Queen Anne in 1705, and acted as president of the Royal society from 1703 until his death. The controversy between Newton and Leibniz regarding their respective claims to priority in the discovery of the differential calculus dragged on for a score of years from 1705. The facts elicited left no room for doubt of Newton's originality.

He was engaged in 1694-5 on the laborious task of perfecting his lunar theory, for which purpose Flamsteed's observations were indispensable. They were communicated partially and reluctantly, and the annoyances involved caused Newton to abandon his pursuit of the moon's inequalities. This contest embittered seven years of his life. He died at Kensington, 1727, and was buried in Westminster abbey.

**References.**—See *Life*, by Sir David Brewster, and A. de Morgan; also Lodge's *Pioneers of Science*; and Hawthorne's *True Stories*.

**Swman, John Henry**, English prelate and author, was born at London, 1801, son of a London banker. He was graduated from Trinity College, Oxford, 1820, and took orders in 1824. He took a leading part in the tractarian movement, and in 1841 wrote *Tract XC.*, which was severely condemned. After living at Littlemore for some years in seclusion, he was received to the Roman Catholic church, 1845. He was created a cardinal in 1879, and during his short life as apostolic vicar of the United States. He was a great writer. Died, 1890.

**Key (nd), Michel**, French marshal, was born in Saarbrücken, now in Prussia, 1769, the son of a French officer. He was a general in 1796, was killed in 1798; became a general of brigade in 1806, and distinguished himself by his bravery. When Napoleon abdicated in 1814 he attached himself to Louis XVIII., but on the former's return from Elbe he joined his old master, and stood by him during the hundred days. He was defeated by the allies at Waterloo, and was afterwards named the Old Guard at Waterloo on June 18th. On the second restoration he was arrested, tried by his peers, and shot, December 7, 1815.

**Nicholas I.**, emperor of Russia, third son of Paul I., was born at St. Petersburg, 1796. In 1828 the war with Persia began, and on its close occurred the war with Turkey. This was followed by the rising of Poland, which he subdued, and reduced the kingdom to a mere province. His rule now became despotic and fierce. Died 1855.

**Nikolai II.**, son of Russia, was born in St. Petersburg, 1868, son of Alexander III, whom he succeeded in 1894. During the famine of 1891, he organized the relief of the starving, and was a member of committees of rescue, and worked hard in the organization of relief. He married Princess Alix of Hesse-Darmstadt in 1894. The coronation took place in 1896. He visited the United States at Moscow in May, 1896, and in August of the same year he commenced a tour which included visits to the United States, Canada, and Mexico. He was crowned king of Denmark, to Queen Victoria, and to the president of France. His reign has been marked by the construction of the trans-Siberian railroad, the Russo-Japanese war, and the revolution of 1905, by adroit diplomacy with China, by a strong and conservative attitude toward Turkey, as well as toward the Balkan powers, and by the granting of a constitution in 1905.

**Nicholas V., pope, Tommaso Parenteucci,** was born near Pisa, Italy, 1397. He was educated at Bologna and Florence, went to Rome in 1426, and entered the ecclesiastical service. He was chosen pope in 1447. A liberal patron of scholars, he despatched agents east and west to purchase or to copy important Greek and Latin manuscripts, and may almost be said to have founded the Vatican library. Died, 1455.

**Nicholas, Edward Leamington**, American physicist, professor of physics, Cornell, since 1887, was the son of American parents, a Leamington, England, 1834. He was graduated at Cornell in 1875. He is editor-in-chief of the *Physics Review*, and author of *The Galvanometer*; *A Laboratory Manual of Physics and Applied Electricity* (2 vols.); *The Elements of Physics* (3 volumes).

**Nicias** (nikh'-as), Athenian statesman and general of the Peloponnesian war, was the son of the

wealthy Nereetus. In 427 B. C. he defeated the Spartans and Corinthians, and ravaged Minor Meios, and Loeira. In 415 he was appointed one of the commanders against Sicily, and in the autumn laid siege to Syracuse. At first successful, later his fleet was destroyed, his army began a retreat, and he was captured and put to death in 413 B. C.

**Nicoll** (ask'ul), **De Lancey**, American lawyer, was born at Bayside, L. I., N. Y., 1854. He graduated from Columbia University, 1876; Columbia Law School, 1876; was admitted to the bar, and has since practiced law in New York city. He was nominated by the Tammany organization for district attorney, 1887; was elected and served three years. Is now a member of the law firm of Nicoll, Anable and Lindsay, and has appeared in numerous corporation cases.

**Niebuhr** (*nee'boor*), **Barthold George**, German historian and eritic, was born in Copenhagen, 1776, where his parents then resided. He was educated at Kiel and Edinburgh, held several appointments under the Danish government, and entered the Prussian civil service in 1806. At the opening of the University of Berlin, in 1810, he became connected with the University. His greatest work is his *History of Rome*, upon which he was engaged for many years. His *Lectures on Roman History*, and several other works, were published after his death by Dr. Schmitt and others, from notes of Niebuhr's own lectures. He died

**Niehaus** (as/hous), **Charles Henry**, American sculptor, was born at Cincinnati, Ohio, 1855. He was educated in the Cincinnati schools, and at the Royal Academy, Munich, Germany. Among his works are: equestrian statue of General Forrest, Memphis, Tenn.; statue of McKinley and lunette for tomb at Canton, Ohio; Benjamin Harrison monument, Indianapolis; pedimental statue capital, Frankfort, Ky., etc.

**Nelice** (*Altura*). **Alice** (born Kentucky, U.S.A.). American opera singer. She was born at Nashville, Tenn., daughter of Erasmus Iverius. She received her musical education in San Francisco, under Mlle. Ida Valera, and made her first stage appearance with an operatic company at Oakland, Cal., 1893, as Yum Yum in *M. de la Huchette*. She made her New York debut, and made her first appearance in grand opera at the Bellini theater, Naples, Italy, as Marguerite in *Faust*; appeared at San Carlo opera house, Naples, in *La Traviata*, and at Covent Garden, London, in *Don Giovanni*, *The Marriage of Figaro*, *La Huchette*, *Il Trovatore*. She toured the United States in grand opera, 1901-02.

**Nightingale, Florence**, a famous philanthropist nurse, was born at Florence, Italy, 1820, of wealthy English parentage. At the age of twenty-two entered the Institution of Protestant deaconesses at Kaiserswerth to be trained as a nurse, and afterward studied the methods of nursing and hospital management with the sisters of St. Vincent de Paul, Paris. In 1854 she volunteered to organise a staff of nurses during the Crimean war, and, during the winter of 1854-5, she ministered with unwearied devotion to the suffering soldiers. She wrote *Notes on Nursing*. *Notes on Hospitals*, etc. Died 1910.

**Nikisch** (N'ish), **Arthur**, noted Hungarian orchestral conductor, was born in Lőbény Saint Miklos, 1855, and at an early age disclosed extraordinary musical talent. He remained at the Vienna conservatory for eight years; was appointed first violinist at the royal opera; and, in 1878 went with Neumann to Leipzig, where he was made assistant conductor and conductor in the Old opera house. In 1881 he succeeded Herz as conductor of the Boston symphony orchestra, and in 1895 accepted the post of director of the royal opera at Budapest. He is one of the greatest conductors of our time.

**Nilsson** (nî'ssŭn), **Christine** (Comtesse de Mirande), Swedish operatic singer, was born at Wexö, Sweden, 1843, daughter of a peasant. She made her début at Paris in 1864, in London, 1867. She repeatedly visited the United States. In 1871 she married M. Rousand, who died in 1882; and in 1887, at Paris, she became the wife of the Comte de Mirande, and retired.

de Muland, and Putney.  
 was born in Leeburg, La. 1861. He was graduated at the United States Naval College, 1882. He went next to the Royal Naval College, Greenwich, England, by navy department, and transferred to construction corps of the navy, 1889. He served on the battleships *Oregon*, *Indiana*, and *Massachusetts*, and then resigned from navy to become superintending constructor of the Cramp shipyard, Philadelphia, Pa., and in 1893 founded the Crescent shipyard, Elizabeth, N. J. He spent 10 years as a work part on the East River bridge commission, 1898; appointed, 1900, New York commissioner to Louisiana Purchase

exposition, St. Louis. He succeeded Richard Croker as leader of Tammany Hall, 1901-02. Nobel (c. 6-4), Alfred Bernhard, Swedish chemist and engineer, was born at Stockholm, 1833. He studied at the universities of Uppsala, Berlin, Göttingen, Petersburg, and in 1862 began to manufacture nitroglycerine. In 1867 Alfred, who assisted his brother, Robert, in the manufacture of some of the explosives, was the first to suggest the use of sand of the packing, how to make a safe and manageable explosive—dynamite. He also introduced the use of blasting caps, and the use of less powder. At his death at St. Remo, Italy, in 1896, he left a fortune of over 2,000,000 pounds, some of which he destined to go for annual prizes for the making of the most important discovery in physics, chemistry, physiology, writing the best literature, and accomplishing the most for

**Noda** (a'da), **Mitsutaru**, Count, Japanese general, was born in Setsumi, 1840. He fought on the side of the Meiji government in the war of restoration, and with imperialists in the Satsuma rebellion. During the war with China he captured Pinyang; was placed in command of the 8th division; later on appointed commander-in-chief of the first army, and, during the Japanese and Russian war, commander-in-chief of the fourth army. He was created a baron, 1895.

**Nogi** (nô'gë), **Kiten**, Baron, Japanese general, was born in Choshi, Japan, 1849. He served in the Russo-Japanese war, and was severely wounded. He commanded the third army in the Russo-Japanese war, and captured Port Arthur, 1905. He was created baron in 1905.

**Nogin** (nô'gin), **Isidor**, French novelist, critic and writer, of Jewish descent, was born at Budapest, 1849, but is a Prussian subject. He received the citizenship of France in 1881, and of Italy in 1882. He was co-founder and for many years vice-president of the association *Littérature et Art*. He was a member of the Académie Française. His book on Paris appeared in 1878; others, more especially two in English translation, *Constitutional Law of the Republic of France*, and *Constitutional Law of the Republic of Austria*, and a considerable number of others, and led to considerable discussion.

**Nordenskjöld** (nó'renshó'ld), **Nils Adolf Eric, Baron**, Swedish explorer, geologist, was born at Helsinki, Finland, 1832. In 1854 he was appointed state mineralogist at Stockholm, obtained letters of naturalisation as a Swedish subject, and was a member of the chamber of commerce during his residence in the Swedish capital. After several successive voyages and explorations in the Arctic sea, he in 1878-79 discovered the northeast passage. He was created baron in 1880. Died, 1901.

**Northoff** (nord'of), Charles, American author, was born at Erwitte, Prussia, 1830. He came to the United States with his parents when a child of five years. From 1861 to 1871 he was editorial writer for the *New York Evening Post*. The next two years he spent in travel through California and the Hawaiian islands. He then became Washington correspondent for the *New York Herald*. His principal works are: *A Manual of War Life: The Merchant Vessel*. Died, 1901.

**Nordica** (nôr'dî-ka), **Lillian**, née Lillian Norton, stage name of Mrs. Zoltan F. Dome, American prima donna, was born at Farmington, Me., in 1859. Her early education was pursued at the New England conservatory, Boston, and her later studies at Milan, Italy. She made her debut as an opera singer at Brescia, Italy, in *La Traviata*. She has sung leading soprano parts in forty operas and in all the standard oratorios, but she is best known in Wagnerian parts. She has appeared in grand opera in the United States

**Norman, Sir Henry**, English journalist, author, and traveler, was born at Leicester, England, 1858. He was graduated from Harvard College in 1881. He was several times sent abroad upon important missions on account of his proficiency in modern languages. In 1895 he was sent to Constantinople to report upon the Armenian massacres; and from there proceeded to Washington, D. C., to write for the London *Daily Chronicle* the status of the Monroe doctrine. He was elected to parliament in 1900; founded *The World's Work* in 1902. He was knighted in 1906.

**North, Frederick**, eighth Lord North and second earl of Guilford, English statesman, was born in 1732, and educated at Oxford. He entered the house of commons at the age of twenty-two, and was made junior lord of the treasury in 1759. In 1770 he became prime minister, and his course to a large extent, caused England to lose America. He resigned in 1782, and became blind five years before his death, which occurred in 1792.

Norton, Charles Eliot, American educator, critic, and scholar, professor of art at Harvard, 1874-98, was born at Cambridge, Mass., 1827. He graduated at Harvard, 1848; M.A., 1850; LL.D., 1883. L.H.D., Columbia, 1885; LL.D., Harvard, 1887, Yale 1901; honorary D.C.L., Oxford 1900. In 1864-68 he was joint editor with Lowell of the *North American Review*. In 1874 he was appointed professor of the history of art at Harvard, and in 1879 became president of the Archaeological Institute of America, holding that office for eleven

**years.** Editor: *Letters of James Russell Lowell: Correspondence of Carlyle and Emerson; Correspondence of Goethe and Carlyle; Reminiscences and Letters of Thomas Carlyle*, 1918. Editor, translator and translator of Dante's *Vita Nuova* and *Divina Commedia*, 1922, 1928.

**Norvalle** (ed-er), German lyric poet and philosopher, was born in Saxony, 1772. His real name was Friedrich Ludwig von Hardenberg. His principal works and *Lesser Lyrical Poems*, *Biblical as die Nacht*, and an unfinished art romance entitled *Heinrich von Ofterdingen*. He died of consumption, 1842.

**Noyes, George Bassett**, American biblical scholar, was born in Massachusetts, 1798. He was graduated at Harvard College, 1818, and studied theology at Cambridge Divinity School. In 1840 he was made professor of Hebrew and oriental languages and *Lesser Lyrical Poems*, *Biblical literature* at Harvard University. Died, 1868.

**Nye, Edgar Wilson**, American writer and humorist, who wrote largely under the pseudonym of "Bill Nye," was born at Shirley, Me., 1850. He studied law and later went to Wyoming where he was admitted to the bar and elected to the legislature. On account of ill health he returned to the East and settled in New York, having already achieved considerable popularity through his humorous contributions to the press. In connection with James M. Smith, he wrote the frequent satirical *Cartoon*, giving entertainments consisting of lectures and readings. He died near Asheville, N. C., in Feb., 1902.

**Oberlin (oh-ben), Jean Frederic**, German clergyman and philanthropist, was born in Strassburg, 1740. He was educated at the University of Halle, studied theology, became a German Lutheran clergyman, and was celebrated for his philanthropy, and for active benevolence. He was founder of Ban-de-la-Roches, among whom he labored for fifty-nine years. His name was celebrated throughout Europe, and he was elected to the Academy with the decoration of the legion of honor. Oberlin College, Ohio, is named after him. Died, 1825.

**O'Brien, Morgan Joseph**, American lawyer and jurist, judge of the New York supreme court, 1857-90, and of the New York circuit court, 1890-97, was born in New York, 1832. He was graduated at St. John's College, New York. He is a trustee of the New York public library, and of the New York public library, and trustee of Equitable life assurance society of the United States since 1905.

**O'Brien, Thomas J.**, American lawyer and jurist, was born at Jackson, Mich., 1842. He was graduated from the law department, University of Michigan, 1865, and practiced law in Detroit, 1864. Candidate for judge of the supreme court of Michigan, 1883; E. E. and M. P. to Denmark, 1887, and American ambassador to Japan since 1907.

**Ockam (oh-om), or Okham, William of**, English philosopher, was born at Ockham in Surrey, between 1270 and 1280. He was a Franciscan monk, studied at Oxford and Paris, and headed the Franciscan revolt against Pope John XXII's denunciation of evangelical poverty. His views on civil government are expounded in his *Dialogues*; his philosophical views in *Summa Logice*, in his commentaries on Porphyry and Aristotle, and the commentary on the *Sententiae* of Peter the Lombard; and his theological views in this last and the *Tractatus de Sacramento Altaris*.

**Ochs (oh), Adolph B.**, newspaper publisher, was born in Cincinnati, Ohio, 1838. He received a common school education at Knoxville, Tenn., established *The Tradesman*, 1879, of which he is still principal owner. He became publisher and principal owner of the *New York Times*, 1896; publisher and principal owner *Philadelphia Public Ledger*.

**Ochs, George Washington**, journalist, was born at Cincinnati, Ohio, 1861. He was educated at the University of Tennessee, and was elected mayor of Chattanooga, Tenn., was decorated chivalier of legion of honor by French government. He became general manager of *Philadelphia Times*, 1901; in 1902 the *Public Ledger* and the *Philadelphia Times* consolidated under the name of *Public Ledger*, and he became its publisher and general manager.

**O'Connell, Daniel**, Irish orator and "liberator," was born in County Kerry, Ireland, 1775. He was admitted to the Irish bar in 1798. His large practice, worth, he said, \$35,000 a year, was confined for his time, which he took with him to part in Irish politics. He was head of the Catholic party and contended for the admission of Catholics to parliament, and himself entered parliament, in 1829. In 1844 he, with his son and five others, was tried for sedition and sentenced to imprisonment for one year, which he served in England, though the house of lords soon set aside the verdict, the fourteen weeks he was in prison brought him the ailment of which he died in 1847.

**O'Connell, Daniel**, Irish orator and "liberator," was born at Charleston, S. C. He was educated at St. Charles' Seminary and St. Mary's College, Charleston, S. C., 1827. He was elected to the U. S. House of Representatives, 1827. He was for some time secretary to Cardinal Gibbons, was head of the American College in Rome

several years, and rector of the Catholic University of America, 1903-09.

**O'Connor, Thomas Power**, journalist and parliamentarian, was born in County Wick, Ireland, 1848. He was born at Athlone, Ireland, 1848. He took up journalism in Dublin and went to London later. He was a member of the staff of the *Daily Telegraph*. He was afterward employed in the London office of the *New York Herald*, and in the London office of the *Standard*, 1880. He was returned for both Galway and Liverpool, 1885; chose the latter, and was again returned, 1892, 1898, 1902, 1906.

**Lord Beaconsfield, a Biography; Gladstone's House of Commons**.

**O'Connell, James**, American lawyer, was born in New York city, 1804. At the age of twenty he was admitted to the bar of New York, and soon gained high rank in the profession. He was counsel in many important cases; was prosecuting lawyer in the "Cotton" case; and in 1871 was nominated in the face of his absolute refusal for the presidency by the labor reform party, and by a convention of democrats dissatisfied with the nomination of Horace Greeley. Died at Nantucket, Mass., 1884.

**Odoacer** (oh-doh-aser), the Roman emperor Augustus, and wife of Mark Antony, was born about 60 B. C. Her first husband was C. Marcellus, and she was married to him in 43 B. C. After the fall of Julius Caesar, she was married to Mark Antony, who was killed in 41 B. C., shortly after which she consented to marry Antony, to make secure the reconciliation between him and Octavian, and to secure the war, long inevitable, broke out between Antony and Octavian, and the former covered his insults by the murder of his wife's favorite, P. Clodius. No injury was too great to be forgiven, and after her husband's death she brought up with maternal pride her son, who was called Octavianus, or Augustus, also. Her death took place 11 B. C.

**Odoacer** (oh-doh-aser), king of the Germanic tribe of the Herali, ruler of Italy from 476 to 493, was born in the East. He was a Hun, and one of his ambassadors to the court of Constantinople. He entered the military service of the Western Roman empire, rapidly rose to ambler, and took part in the revolution by which Orestes, in 476, drove the emperor Julius Nepos from the throne, and overthrew himself to be a wise and polite ruler, quite unlike our general notion of a barbarian. But on March 28, 493, Odoacer was assassinated by Theodoric, king of the Goths, and his command.

**Olenschlager** (oh-len-shlag-er), Adam Gottlieb, German poet and dramatist, was born at Copenhagen, 1779. In 1803 appeared his first collection of poems, including one longer dramatic poem, *Die Helden von St. Jago*. He received a favorable notice for the lively fancy with which national habits and local characteristics were personified in his poetical works, and in his thirty volumes. His rank among the Danes as Goethe among the Germans, and his death in 1850 at the age of 71.

**Oersted** (oh-sterd), Hans Christian, Danish physicist, was born at Roeskilde, in the island of Langeland, 1777. He studied at the University of Copenhagen and received the degree of Ph. D. there in 1799. In 1819 he published his famous essay entitled *Experimentum in Effect of Opposite Electricity Upon the Magnetic Needle*, in which he discovered the identity of the force of magnetism, electricity, and galvanism, and thus opened the way for the wonderful development of knowledge in these three forces, which was one of the chief scientific glories of the nineteenth century. Died at Copenhagen, 1851.

**Olfenbach** (oh-fen-bach), Jacques, French composer of comic opera, was born in Cologne, 1819, of German-Jewish parents. In 1837-37 he studied music in the conservatory. He was employed as manager of the *Opéra* theatre in 1873, and sank some millions of francs in the experiment. He was elected to the United States. Died at Paris, 1880.

**Oden, Robert Curtis**, retail merchant and philanthropist, was born in Philadelphia, 1857. He was educated in select schools at Philadelphia; M. A., Yale, 1902. He was president of the board of directors of the Hampton Institute, 1902. He was director of Union Theological Seminary, New York; trustee of Tuskegee Institute, Alabama, since 1908.

**Oglethorpe** (oh-gle-thor-pe), James Edward, English general and founder of Georgia, was born at London, 1696. He was a member of the House of Commons, and was thirty years in parliament. He planned a colony in America, as a refuge for debtors, who were sent to the colony in 1733. He was elected to the House of Commons, and was thirty years in parliament. He planned a colony in America, as a refuge for debtors, who were sent to the colony in 1733. He was elected to the House of Commons, and was thirty years in parliament. He planned a colony in America, as a refuge for debtors, who were sent to the colony in 1733. He was elected to the House of Commons, and was thirty years in parliament.

**Olm (oh), Georg Simon**, German physicist, was born at Bamberg, Bavaria, 1803. He was educated at the University of Erlangen, held the chair of physics at Cologne from 1817 to 1826. He was a member of the Academy of Sciences, and the measure of resistance, called the ohm, was named in honor of his achievements.

by the Paris congress of physicists in 1881. He died at Munich, 1894.

**Ohnet (oh-net)**, Georges, French novelist of great popularity, was born in Paris, 1848. He was educated at Sainte Harbe, and at the Lycée Bonaparte. Under the general title of *Les Bastards* he published a series of novels, the most popular of which have reached a hundredth edition. Chief of these are: *Serge Panine*; *Le Maître des Forges*; *Le Comte de Montfort*.

**Olsen** (oh-len), Lorenz, German naturalist, was born at Berlin, Sweden, 1779. He became professor of medicine at Lund in 1807, and in 1816 issued a journal called *Isis*, which led to government interference and his resignation. Died 1854.

**Oksu (oh-oh)**, General Hekko, Count, Japanese soldier, a Samurai of Ke-Kun was born in 1845. He entered the army in 1867, and in 1868 issued a journal called *Isis*, which led to government interference and his resignation. Died 1854.

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is author of the following works: *A History of Greece*; *Warwick the King-maker*; *Short History of the Byzantine Empire*, etc.

On the 24th of September, 637, A.D., 'Abu-Bakr al-Kharrab. second caliph of the Moslems, was born about 581. After Mohammed's death he caused Abu-Bakr to be proclaimed caliph, and was himself appointed prime minister. On the death of Abu-Bakr, Omar succeeded as caliph, and pushed on the wars of conquest with increased vigor. He was summoned to Jerusalem, in 637, to receive the keys of that city, and before leaving gave orders to build a mosque, so called by his name, on the site of the temple of Solomon. He instituted the practice of dattin from the beggars. He died in 644.

**Omar Khayyām** (*ʿOmār al-Khayyām*), astronomer-poet of Persia, was born at Nishapur about 1017, and he said to have died there in 1123, or 1124. Omar was the poet of agnosticism, though some see nothing in his poetry save the wine cup and roses, and others read into it that Sufi mysticism with which it was largely adulterated long after Omar's death. He was a true poet; yet Fitz-Gerald's translation is far finer than the original.

**Omer Pasha** (*d'émér-pa-shâs*), Turkish general, was born at Plank, in Croatia, a province of Austria, 1806. When he died because of suicide, he was Omer Pasha, governor of Lebanon. When the Russians invaded the European dominions of Turkey, he was sent with an army of 60,000 men against them, and successfully withstood them at Kalafat, and, after their withdrawal from the country, entered Bucharest in triumph, August, 1854. He was governor-general of Bagdad, and also minister of war at different periods. He died at Constantinople, 1871.

**Ontario, Bishop, of.** See **Mills, William Lenox.**  
**Oppenheim, Nathan,** American physician, medical author, was born at Albany, N. Y., 1865. He was graduated at Harvard, 1888, and from the College of Physicians and Surgeons, New York, 1891. He is attending physician, children's department, Lebanon hospital. Author: *The Development of the Child; The Mental Diseases of Childhood; The Care of the Child in Health, Sickness, Growth and Control*; and various scientific papers.

**Opper, Frederick Burr**, American artist, was born at Madison, Ohio, 1857. He left school at fourteen. He was on the art staff of *Frank Leslie's* three years; an artist on *Puck* for eighteen years, and severed his connection with *Puck*, to accept

**Optic, Oliver**, American writer of books for young folks, was born in Medway, Mass., 1822. His real name was William T. Adams, and he was for several years a public school teacher in Boston. He wrote a large number of books which are published in several series. *Oliver Optic's Magazine* for Boys and Girls was edited by him for many years, but it was discontinued in 1875. He died at Boston, 1887.

**Orange, Prince of.** See William I., the Silent;  
William III., king of England.

**Orsagna** (ôr-săg'ya), **Andrea di Cione**, Italian painter, sculptor, architect, and poet, was born at Florence, about 1368. He was chief architect of the cathedral at Orvieto. The frescoes of the *Last Judgment* and *Christ and the Doctors*, in the church of Santa Maria at Florence, still survive as examples of his painting. His work was studied by succeeding painters, especially by Michelangelo and Raphael. He died about 1376.

**O'Reilly, John Boyle**, Irish-American poet, was born at Dowth, Ireland, 1844. He passed through the various stages of journalism from type-setting to the writing of editorials. He was tried for treason, convicted, and banished to Australia in 1866. Escaping from that country, he reached the United States in 1868 and became the editor of the *Boston Pilot*. Died, 1890.

**Origen** (*or'-jen*), Greek church father, was born at Alexandria, about 185. Most of his life was spent in the study of the Bible and the

spent in Alexandria, in which city he obtained great reputation as a teacher, but, which he was compelled, by persecution, to leave finally in 321. His writings are said to have amounted to six thousand, but by far the greater number are lost. As to the learning of Origen and his ability as a teacher, we possess the most ample testimony. He died at Tyre, 254.

**Oster** (os'ter), William, Canadian physician, educator, and author, was born at Bond Head, Ontario, 1849. He was graduated at McGill University, Montreal, 1872; LL.D., McGill, Toronto, University of Edinburgh. He was professor of the Institutes of medicine, McGill University, 1874-84; professor of clinical medicine, University of Pennsylvania, 1884-89, and at Johns Hopkins University, 1889-1905. He was a regular practitioner since 1872. Oxford University, since 1905. Author, *The Cerebral Passions of Children; Chorea and Choreaiform Affections; Lectures on Abdominal Tumors; Angina Pectoris and Allied Stages*; etc.

**Osman I.** (os'-mde) or **Othman** (oth'mdn), surnamed "the conqueror," was born in Bithynia 1259. When the Moegols overthrew the sultanate of Iconium, 1299, he seized a portion of Bithynia. From his name the terms Ottoman and Osmanli are derived. He died in 1326.

**Ossian** (oh'shan), Celtic bard, supposed to have lived in Scotland or Ireland about fifteen hundred years ago. He was the son of Fingal, king of Morven, a famous hero, and was blind. His poems are remarkable for their grandeur and wild beauty, and are very different from all other poetry. They have been published in nearly all European languages.

Ossoli (ds' o-lé), Marchioness. See Fuller, Sarah Margaret.

Otto I., the Great, emperor of the West, son of the emperor Henry I., of Germany, was born in 912, and in 936 formally crowned king of the Germans. He consolidated the disjointed power of the German emperors, and established Christianity at many different points in the Scandinavian and Slavonic lands which lay beyond the circuit of his own jurisdiction. Died 973.

Otis, James, son of Samuel and Sarah, was born at West Barnstable, Mass. 1725, and became a leader of the Boston Rev. He was advocate-general in 1760. In 1761, elected to the Massachusetts assembly, he was prominent in resistance to the revenue acts. In 1769 he was savagely beaten by revenue officers and others, and lost his reason. In 1783 he was killed by lightning. His home chiefly rests on *The Rights of the Colonies Asserted*, published by him in 1764.

**Ottawa, Bishop of.** See Hamilton, Charles.  
**Otter, William Dillon.** Canadian general, chief of the general staff, Canada, was born in 1843. He was educated at Upper Canada College, Toronto; served for twenty-two years in active militia; since 1883 in the permanent militia, and saw active service during Fenian raids of 1866 and 1870, Northwest rebellion of 1885, and during the Boer war of 1899-1900. He is the author of *The Guide, or Manual of Interior Economy*, etc.

**Oudinot** (*oud'noht*). Charles Nicolas, duke of Reggio, French general and noble, b. 1733-1801. He served in the revolutionary wars, and in 1805 obtained the grand cross of the legion of honor and the command of two reserve battalions, the "grenadiers Oudinot." In 1810 he was charged with the occupation of Holland, and took part in the Russian campaign and in the battles of 1813 with Russians and Austrians. In 1823 he commanded in Spain; became grand chancellor of the Legion of Honor in 1824, and succeeded Marshal Momey as governor of the Invalides, 1842. He died at Paris, 1847.

**Ouida** (wī'da). See De la Ramée, Louise.  
**Overbeck, Johann Friedrich**. German painter.

Overbeck, Johann Friedrich, German painter, was born at Lübeck, 1789. He studied art at Vienna, 1809-10, and settled in Rome, where he allied himself with the like-minded Cornelius, Schadow, Schnorr, and Veit, who, from the stress they laid on religion and moral significance, were scoffed at as church-romanticists, pre-Raphaelites, etc. His oil-pictures are inferior to his frescoes. He died in 1869.

**Overman, Lee Slater**, lawyer, United States senator, was born in Salisbury, N. C., 1854. He was graduated at Trinity College, N. C., 1874; member of North Carolina legislature, 1883, 1885, 1887, 1893, 1900; and speaker, 1893. He was elected United States senator, 1903, and reelected for the term 1909-15.

**Ovid** (n's'd), or **Publius Ovidius Naso**, Roman poet and writer, was born at Sulmo, Italy, 43 B.C. He belonged to a noble family, and was brought up to the law; but his love for poetry and his natural indolence led him to desert the practice of the law, though he occupied once or two judicial positions. He died in banishment at Tomi, 18 A. D. Beside the *Metamorphoses*, consisting of all the transformations recorded in legend from the creation of the world to the time of Julius Caesar, he was the author of a poem called *Amatoria*, or the "Art of Love."

**Owen, Sir Richard**, British naturalist, was born at Lancaster, England, 1804. He studied medicine at Edinburgh and London, but soon began by work in zoology and comparative anatomy, by preparing catalogues of the collections in the museum of the Royal College of Surgeons, and lecturing on comparative anatomy. Owen's researches in zoology number nearly 400; they are largely devoted to structure, and embrace every class of animals from a sponge to man. Among his voluminous writings are: *Comparative Anatomy of Invertebrates*; *Comparative Anatomy*

**Owen, Robert,** English social reformer, was born in Wales, 1771. In 1799 he married the daughter of David Dale, from whom, with others, he bought the mill at New Lanark, near Glasgow, in Scotland. Here he introduced a system of reform which proved for a time highly successful. He went to the United States in 1824, and tried to found a communist society at New Harmony, Indiana. He was so disappointed that he returned to Great Britain, where experiments of a similar nature, attended by a similar result, were made at Orbiston in Lanarkshire, and at Tythierley in Hampshire. He finally became a spiritualist. D. 1858.

**Owen, Robert Latham**, lawyer, United States senator, was born at Lynchburg, Va., 1856. Began practice of law, 1880; United States Indian agent for the five civilized tribes, 1885-89. He

He is the owner of extensive banking, real estate, farming, and cattle interests. As attorney for Choctaws and Chickasaws he recovered from the United States government, in money, nearly \$1,000,000. He directed the removal of the giving United States citizenship to every Indian in Indian territory. He was elected United States senator from the Choctaw and Chickasaw counties in 1890. He died in 1904.

Oyama (ô'yô-mô), Iwao, Prince, Japanese field-marshal, was born in Kanagawa, 1844. He

entered the Japanese army, was appointed a colonel in 1871, promoted major-general in the same year, lieutenant-general in 1877, general in 1881, and in 1898 was raised to the rank of field-marshal. He was sent to France in 1894, and on his return, Franco-Prussian war, upon his return to Japan, he entered the ministry of war, and assisted in the work of reorganizing the army. In 1904 he was chief of the general staff, and when war broke out between Russia and Japan he was appointed in-chief in Manchuria defeating the Russians at the three great battles of Liau-Yang, the Sheho, and Mukden. He received the order of merit, 1905, and the order of the Rising Sun, 1906, and in April, 1910, he was created prince in 1910.

**Frackard, Alpheus Spring**, American naturalist, was born at Brunswick, Maine, in 1839, was graduated from Bowdoin in 1861, and became assistant to Agassiz at Cambridge. After taking part in several scientific expeditions, he became state entomologist of Massachusetts, and professor of zoology and geology at Brown University. Besides many technical papers, his publications include, *Guide to the Study of Insects*; *Our Common Insects*; *Zoology*; *Entomology for Beginners*;

**Paderewski** (pa'de-ref'ski), **Ignace Jan**, Polish pianist and composer, was born in Podolia, Russian Poland, 1860. In 1872 he went to Warsaw, studied under Roguski, and subsequently pursued his studies under the late Frederick Kiel of Berlin. In 1884 he resolved to adopt the career of a virtuoso, removed to Vienna, placed himself under his fellow-countryman, Theodor Leschetzki.

and at the expiration of three years' hard study made his debut. Afterward he visited Germany, and in the autumn of 1889 made his first appearance before a Parisian audience. His first appearance in the Metropolitan Opera House was in London, 1890, and he has paid four visits to America. He has written *Manru*, an opera, *Suite for Orchestra in G*, etc.

**Paganini** ('pag'-ni-ni). **Niccolò**, Italian violinist, son of a commission broker at Genoa, was born in 1781. His musical talent showed itself in his childhood. At the ninth year he had instructions from Costa at Genoa, and afterward from Rolle at Parma, and from Ghirelli. In 1831 his violin playing earned an equal furor in Paris and London. His mastery over the violin has never been equalled. He died in 1840.

**Page, Thomas Nelson.** American author, was born on Oakland plantation, Hanover county, Virginia, 1853. He was educated at Washington and Lee University; LL.B., University of Virginia, 1874; LL.D. Washington and Lee, 1887, Yale, 1901; LL.D. Tulane University, 1899. He practiced law at Richmond, Va., 1875-83, but subsequently turned to literature and lecturing. Author: *In Old Virginia*; *Two Little Confederates*; *On Newfound River*; *The Old South*; *Among the Camps*; *Elkshot and Other Stories*.

**Page, Walter Hines.** American journalist and

writer, editor of *The World's Work* since 1900, was born at Cary, N. C., 1855. He was educated at Randolph-Macon College, Virginia, and Johns Hopkins University; LL.D., Randolph-Macon, and Tulane. He was literary adviser to Houghton, Mifflin and Company, 1895-99; editor of *The Atlantic Monthly*, 1896-99. Author: *The Rebuilding of Old Commonwealths*, etc.

**Raget** (pa'ri), Sir James, English surgeon, was born at Yarmouth, England, in 1814. He entered the Royal College of Surgeons in 1836, became member of the council in 1865, president in 1875, and Bradshawe lecturer in 1882. He was made a baronet in 1871, and also an LL.D. by the University of Edinburgh. His works are *Lectures on Surgical Pathology*, *Clinical Lectures*, etc. Died at London 1899.

**Raine, John Knowles**, American composer and organist, professor of music, Harvard, since 1875, was born in Portland, Maine, 1839. He studied music under Herman Kretschmar there; made his first appearance as soloist at the age of 17; went to Germany under Haupt and others, 1858-61; and made an artistic tour there, 1866-67. He was instructor in music, Harvard, 1867-73, and became professor there in 1876; A.M., Mus.D., he received from the same institution in 1877. His compositions performed in Greek at Cambridge, 1861; *Hymns of the West*, words by Steedman, sung at the opening of the St. Louis exposition, 1904; *The Fenimore, St. Francis, Requiem of Peace*, *Eucharistic cantata*. Died 1896.

**Paine, Thomas**, Anglo-American writer, was born, 1737, at Thetford, England. In 1774 he came to America, was favorably received by a bookseller in Philadelphia, and in 1776 published a pamphlet entitled *Common Sense*, in which he set forth the cause of the colonies against the mother country. The success and influence of this publication were such that it was called the "friendship of Washington, Franklin, and other distinguished American leaders. In 1791, he published *The Rights of Man*, in which he set forth all the replies to Burke's *Reflections upon the French Revolution*. In 1792 the department of the United States sent him a deputation to the national convention, where he usually voted with the Girondins. At the trial of Louis XVI, he proposed that the king should be executed, and was offered an opportunity of seeking an asylum in America. In 1802 returned to the United States, and died, 1809.

**Palestrina** (pál'-strá'-nd), Giovanni Pierluigi, distinguished Italian composer, was born near Rome about 1514. In 1543 he was made master of the Julian chapel, Rome, and in 1554 published a collection of masses, so highly approved by Pope Julius III., to whom they were dedicated, that he appointed their author one of the singers of the pontifical chapel. During the remaining years of his life the number and the quality of the works of Palestrina were remarkable. He died in 1594.

**Paley** (pál'-y), William, English divine and writer, was born at Peterborough in 1743. He was educated at Christ Church, Oxford, and for ten subsequent years he resided at the University. In 1783 he was elected to the chair of divinity at the University of Cambridge. He was successively made vicar of Haverhill, a prebendary of St. Paul's, successively a doctor of divinity, and rector of Bishop's Wearmouth. Died, 1805.

**Palliss** (pál'-s), Bernard, French artist and philosopher, was born about 1514. He was apprenticed in a glass work at Agen, where he learned the art of painting on glass. Having completed his apprenticeship he set out on a tour of France and Germany. In 1528, maintaining himself by practicing the craft of glass painter and by land surveying. During his travels he studied attentively all the books within his reach, and acquired an extensive knowledge of the sciences of his time.

In 1535 he returned to France, married, and settled at Saintes. Shortly after his return his attention was attracted by a fine crucifixion of enamel, which he saw there upon resolved to discover for himself the secret of the enamel. Being ignorant of the potter's art he had to grope his way, and labored after year after year without success, almost starving, and reducing his family to the depths of poverty. At length, after sixteen years of unremunerated labor (1538-54), he obtained a pure white enamel, affording a perfect ground for the application of decorative art.

He was now able to produce works in which he represented natural objects grouped and portrayed with consummate skill, and his enamelled pottery and sculptures in clay became recognized as works of art.

In 1562 he went to establish himself at Paris, where he continued to work in his art, and also delivered scientific lectures, which were attended by the most distinguished men in Paris, and continued views far ahead of his time. He suffered persecution as a Huguenot, and was arrested in 1589 and thrown into the Bastille, where he is said to have died in 1600. He left several philosophical works.

**References**—Morley's *Palliss the Potter*, and *Lives of the Burys and Dupays*; Lamar's *Celebrated Characters*; Wood's *Peopling of Europe*.

**Palladio** (pál'-a'dyó), Andrea, famous Italian architect, was born at Vicenza, 1518. After having studied with the greatest care the writings of Vitruvius and the monuments and ruins at Rome, he settled in his native city, and first acquired a reputation by his restoration of the basilica of Vicenza.

**Palma** (pál'-ma), Tomas Estrada, Cuban patriot, was born about 1836 in Bayamo, Cuba; studied law at University of Havana, and was active in the Cuban revolution of 1895-78, and took part in the Cuban revolution of 1895-78, and became president of the Cuban republic, but was captured, 1877, and the imprisonment and sufferings ceased, 1878. During the last Cuban revolution he was delegate-at-large and minister plenipotentiary for Cuba republic, and subsequently president of Cuba, 1902-06. He died, 1908.

**Palmieri**, Alfred Freeman, American educator, was born at Coleville, N. Y., 1855. She graduated

at the University of Michigan, 1876; was professor of English at Wellesley College, 1877-87, 1882-87; and non-resident dean of the women's department, University of Chicago, 1887-91. She was also professor of German and professor of philosophy in Harvard University, in 1887. Died, 1902.

**Palmieri**, Edward Henry, English explorer and orientalist, was born, 1840, at Cambridge. He graduated from Cambridge in 1867. In 1881 he was elected to the chair of Oriental History in the Standard. In 1882, on the eve of Arabi's Egyptian rebellion, sent by government to war over the Nile. He was captured, and Edward Henry and Lieutenant Charrington were on August 11th murdered in the ravine of Wady Badr. Among *Palmieri's* works are the *Desert of the Exodus*; *Palmieri's Dictionary*.

**Palmieri**, Erasmus Dow, American sculptor, was born at Pompey, N. Y., 1817. He was a joiner, and made carvings first of animals and leaves in wood. Seeing a cameo head, he cut on a shell portrait of his wife, and his success induced him to try working in marble. He executed busts of Alexander Hamilton, Washington, and George Washington. He was the *Landlord of the Palmaria*, in the capital at Washington, one of his largest works. He died, 1904.

**Palmieri**, George Herbert, American educator and scholar. Afforded professor of natural religion, moral philosophy, and civil polity, Harvard, 1864. He was elected to the chair of Natural Religion at Harvard, 1864; L.L.D., University of Michigan, 1894; Union, 1895; Harvard, 1906; and was successively fellow of the University in Greek at Harvard, 1870; assistant professor, 1873-83, and professor of philosophy, 1883-90.

**Palmieri**, G. O. G. A. English tractarian in rhythmical prose; *The Lifed Works of George Herbert*; *Life of Alice Freeman Palmer*, etc.

**Palmieri** (pál'-mí-ry), Henry John Temple, Viscount, Irish statesman, was born at Londonderry, in Hampshire, 1784. He entered parliament as member for Newport in 1807, and in 1811 became member for the University of Cambridge, which constituency he represented until 1831. Lord Palmieri was engaged in official life during nearly the whole of his career. In 1809 he became home secretary under the earl of Aberdeen, when he succeeded as first lord of the treasury in 1835. In 1838 he was defeated and compelled to resign office owing to a conspiracy bill arising out of Orsini's attempt to assassinate Napoleon III. He was the following year returned to power, and remained prime minister until his death. He was a statesman of unerring tact and sound judgment in relation to foreign policy, of which he was an acknowledged master.

**Pao** (pál'-a), Pasquale, famous Corsican patriot, was born in 1725 at Morosaglia, in Corsica. In 1769 he was elected captain-general of Corsica. In 1794 he joined the British in driving out the French. He then surrendered the island to the British, and was banished to France by the government. He quarreled with the British victory. He therefore retired from the island in 1796, and spent the remainder of his life in the neighborhood of London. He died, 1807.

**Pape**, Eric, American artist, illustrator, was born in Philadelphia, 1870. He received his art education in Paris. He exhibited at Paris salon, 1890-1900, World's Columbian exposition, 1893, Munich Kunst, Amstellung, 1897, Omaha exposition, 1898, Paris exposition, 1900, Pan-American exposition 1901, St. Louis exposition, 1904, and at various art museums and exhibitions in the United States and abroad, and has illustrated many important works.

**Papin** (pál'-pín), Denis, French physicist, was born at Blois, 1647. He studied medicine in Paris, where, after receiving his degree, he practiced as a physician. He was undoubtedly belongs the high honor of having first applied steam to produce motion by raising a piston, a discovery which was the principle of action of the explosion. Died at Marburg, Germany, 1712.

**Papinianus** (pá'-pín-a'-dus), Æmilius, Roman jurist, was born at Amulium. He held a high position under Septimius Severus, but was put to death by Caracalla in 212. He was remarkable for his sagacity and his sense of right and morality. Nearly 600 excerpts from his legal works were incorporated in the Justinian's Digest.

**Pappenheim** (páp'-pén'-im), Gottfried Heinrich, Count von, a great imperial general in the Thirty Years' War, was born at Pappenheim, in the Palatinate, of an old and distinguished Silesian family. He served under the king of Poland and the emperor, and was distinguished for his valor. He joined the Catholic faith, defeating the Bohemians at Prague in 1620. At Lützen, in 1632, he was killed in battle. He was mortally wounded by the Swedes, but was mortally wounded in the second charge and died at Leipzig, 1632.

**Papastasi** (pá'-pas-tá-si), George, was born at Constantinople, 1835. He entered the church at sixteen, studied alchemy and chemistry with

Withemina, bishop of Würzburg, and next at the mines in Tyrol, learned the properties of metals and minerals. He acquired fame as a medical practitioner, was made town physician at Basel, and held the post of chief physician at the hospital at Gales and Avignon, and justified the famous estimates that pursued him by his own vastness of knowledge. He was a member of the Parisian Academies. Of some 250 works attributed to him, the critics admit only from ten to twenty-four to be his. The others being by his followers in the "Pascuistia." In spite of his attraction to alchemy and mysticism, he made new chemical compounds, and discovered a phlogisticated phosphorus. Died, 1841.

**Paris** (pá'-ris), Comte de, Louis Philippe Albert d'Orléans, King Louis Philippe, was born in Paris, 1838. He was educated in England. In 1862 he returned to France, entered the national guard, and the Comte de Paris was followed to England where he occupied himself in writing a History of the Orleans family. He was the head of the Orleans family, and a claimant to the French throne. Died, 1894.

**Paris**, Rowell, American physician, was born at Pomfret, Conn., 1852. He was graduated from Racine College; A.M., Harvard; M.D., medical department of Northwestern University, 1876; honorary M.D., Lake Forest University; L.L.D., Yale, 1902. Since 1883 professor of surgery, medicine, and obstetrics, and surgeon to Buffalo general hospital. He is a member of all national and several foreign surgical societies, and is a member of the New York state pathological laboratory in Buffalo.

**Parker**, Alton Brooks, American lawyer, judge, was born in Cortland, N. Y., 1852. He was educated at the Cortland Seminary, Cortland Normal School, and graduated at the Albany Law School; L.L.D., Union University. Appointed justice of the peace, Cortland, 1880. He was elected, 1882, justice court of appeals, second district, 1882. His nomination for the court of appeals, 1896-1902. His nomination for the presidency made on the ballot, 1900. He was elected to the American Bar association, 1906-07, and is now practicing law as a member of the firm of Parker and Wheeler.

**Parker**, Edward Wheeler, statistician, was born at Point Deposit, Md., 1860; was educated at Baltimore, Md., and graduated at the United States Geological Survey since 1891, in charge Division of Mineral Resources and Geology, 1902. He was elected to the United States Census, member Antarctic Coal Strike commission, 1902; expert in charge of historical and geological survey of the United States, 1903; member of the Carnegie Institute. Author: *Annual Reports on Production of Coal in United States*, 1903; *Annual Reports on Production of Coal in United States*; also reports on coal mining, coke manufacture and petroleum refining for United States Census.

**Parker**, Sir Horatio Gilbert, Anglo-Canadian novelist, was born in Canada, 1862. He was educated at Trinity College, Toronto; B.C.L., Toronto. He was trained to journalism in Australia, and there first began his literary and dramatic works: *When Voltaire Came to Fenton*; *The Seats of the Mighty*; *The Battle of the Stars*; *The Lone That Had No Turning*; *The Right of Way*; *History of Old Quebec*; *The Weaver*, etc. He was returned to parliament for Gravesend as a Unionist in 1900, and was knighted in 1902.

**Parker**, Horatio William, American composer and organist, professor of the theory of music, Yale, since 1894, was born at Auburndale, Mass., 1843. He was educated at Auburndale and in Europe; graduated at Royal Conservatory, Munich, 1885; M.A., Yale, 1892; Mus. D., Cambridge University, 1902. He was organist at the Church of the Holy Trinity, Boston since 1893. His *Hora Novissima* was performed at the Chester (England) festival, 1894. He was organist of the church of the three choirs, Worcester, England. He is author of the cantata, *King Trumps and The Kolossal*, and of the oratorio, *How Newman and St. Christopher*.

**Parker**, Joseph, English preacher and author, was born at Huddersfield, 1814. He was educated at University College, London, and became pastor of Congregational chapel at Bathurst, Hampshire, in 1869, of which church he was represented by the City Temple in London. *Ecce Deus* his most noted work. Died, 1902.

**Parker**, John, English archbishop of Canterbury, was born at Norwich, England, 1504. He studied at Corpus Christi College, Cambridge, and at the University of Paris. On the accession of Queen Mary he refused to conform to the reestablished order of things, and was declared a heretic, and was ordered to leave to conceal himself. The death of Mary, and the accession of Elizabeth, called him from his compulsory exile. He was appointed by the queen archbishop of Canterbury. The subsequent history of Archbishop Parker, it has been said, was the history of that church of England. It was under his presidency, that the thirty-nine articles were finally revised and subscribed to by the clergy, 1562. He died, 1575.

Sydenham, near London, 1863.  
**Fayne, John Heward**, American dramatist, was born at New York, 1792. His first appearance as an actor was in that city in 1809. He was a successful actor for thirty years, and also wrote several plays, of which the best known are *Brutus*.



















Persia. During the six years he spent in that country he began to study the cuneiform or wedge-shaped inscriptions, and made a translation of the famous Behistun inscription of Darius, which he published in the *Journal of the Asiatic Society*. He died at London, 1895. He wrote a number of books, among which are: *England and Russia in the East; The Cuneiform Inscriptions of Western Asia; Outline History of Assyria*, etc.

**Bayleigh** (rd'li). **John William Strutt, Lord**, distinguished English physicist, was born in 1812, graduated at Trinity college, Cambridge, in 1865, and became a fellow in the following year. He succeeded to the title of baron in 1873, was professor of experimental physics at Cambridge, 1879-84, and of natural philosophy at the royal institution, London, 1887-1905.

**Raymond, George Launing**, American educator and author, was born at Chicago, 1839. He was graduated at Williams college, 1862; received a degree; A. M., Princeton; L. H. D., Rutgers; graduated at Princeton theological seminary, 1865, and was a student in Europe, 1865-68. professor of aesthetics, 1893-1905, Princeton; professor of aesthetics, George Washington, since 1905. Author: *Colony Ballads; Ideals Made Real; Orator's Manual; Ballads of the Revolution; Sketches in Song; Art in Theory; Pictures in Verses; Rhythm and Harmony in Poetry and in Music; Proportion*.

**Raymond, Henry J.** American journalist, was born at Lima, N. Y., 1820. He was graduated at the University of Vermont in 1840, and after serving for a number of years on the staff of the *New York Tribune* and other papers, he in 1851 founded the *New York Times*, which speedily took rank among the leading journals of the country. Died, 1869.

**Bayner, Isidor**, lawyer, United States senator, was born in Baltimore, Md., 1850. He was educated at the University of Maryland and at the University of Virginia, where he completed the academic and law courses. He was admitted to the Baltimore bar in 1871; member of congress 1886-92, and attorney-general of Maryland in 1899. He was counsel for Rear-Admiral Schley before investigation commission in 1901, and United States senator from Maryland, since 1904. He is recognised as one of the leading lawyers of the senate, is a finished orator, and an authority on

**Read, Thomas Buchanan**, American poet and painter, was born in Chester county, Pa., 1822. He entered a sculptor's studio in Cincinnati, afterward studied painting, and in 1841 settled in Boston, where he began to paint portraits. In 1846 he returned to Philadelphia, and in 1850 went to Florence, where he spent most of the rest of his life. He died at New York, 1872.

**Meade, Charles** was a distinguished English novelist, was born in Oxfordshire, England, 1814. W. graduated at Oxford, secured a fellowship there, and in 1847 was admitted to the bar as a member of Lincoln's Inn. He began his literary career by play-writing; studied the art of fiction for fifteen years and first made his mark as novelist in 1852, when he was nearly forty, by the publication of *Peg Woffington*. This was followed in 1856 by *It is Never too Late to Mend*, and in 1861 by *The Cloister and the Hearth*, the last his best and the most popular. He died in London 1884.

**Réaumur** (ré-ô-mür'), **René Antoine Ferchault** de, French naturalist and physicist, was born at La Rochelle, France, 1683. He was educated at Poitiers, Bourges, and Paris, and was elected a member of the academy of sciences in 1708. He discovered the method of tinning iron; and invented the Réaumur thermometer. He died in 1757, leaving behind him a voluminous array of works, the most important of which is the *Mémoires pour*

**Récamier** (ré'ka'mpé'). **Mme.** (née Jeanne Françoise Julie Adélaïde Bernard), French woman of society, was born at Lyons, France, 1777. At fifteen she was married to the painter Louis Récamier, but she was never united to him, and was attracted to her salon at Paris a brilliant circle during the consulate and empire. A record of the splendid social triumphs of Mme. Récamier would involve notice of nearly all that was distinguished in Paris during a space of about fifty years. She became a power in the whole of French society, and her influence was the chief fortune which ordinarily would have involved the extinction of even more solid celebrity. Died, 1849.

**Reclus** (*Reklus*). **Jean Jacques Ellise**, French geographer, was born at St-Foix-la-Grande, France, 1830. He was educated at Montauban and Berlin. An extreme democrat, he left France after the coup d'état of 1851. In Switzerland he began his masterpiece, *Nouvelle Géographie Universelle*, wrote also a physical geography, *La Terre; son aspect, son histoire, son avenir*. He died in 1905. In 1893 he became a professor at Brunsia. Died, 1905.

**Red Jacket, or Sa-go-yew-at-hs.** "He keeps them awake," a noted chief of the Seneca tribe of Indians, was born at Old Castle, on Seneca lake, New York, about 1751. He was a friend of the whites, though he wished to have the Indians keep their own lands; and, when the six nations made a treaty to sell theirs, he opposed the treaty in an eloquent speech, 1784. Some years after this he visited General Washington, who gave

him a silver medal. In later life he visited New York and Washington, and the speeches that he made there are among the finest specimens of Indian eloquence. He died at Seneca village, near Buffalo, N. Y., 1830.

Reed, Thomas Brackett, American lawyer and legislator, was born at Portland, Me., 1839, and was graduated from Bowdoin College in 1860. He was a member of the Maine legislature; attorney-general of the state; and was elected to congress in 1876. His ability was so clearly recognized that he soon became the acknowledged leader of the republican party on the floor; and, when his party secured a majority of the house of representatives in the fifty-first congress, Reed was chosen speaker. He served in congress until 1899, and was elected speaker of the fifty-fourth

and fifty-fifth congresses. Died, 1902.

**Reed, Walter**, American surgeon and bacteriologist, was born in Virginia, 1851. Received his medical education at University of Virginia and at Bellevue hospital in New York. Reed demonstrated that typhoid fever is spread in camps through flies and personal contact, rather than by infected water, and that yellow fever is caused only by the bite of a certain kind of mosquito. By means of the precautions he urged after the Spanish war, yellow fever was practically exterminated in Cuba. He died, 1902.

**Leaves, John Sims**, English tenor, was born at Shooter's Hill, Kent, 1822. He went to Paris, 1843, in order to perfect his voice and style, and on his return to England in 1847, was recognised as the first tenor in that country; his position was maintained for a number of years. In 1852 he became professor in the Guildhall school of Music, London, and retired from the stage, returning to concert work, however, in 1896. He died at Worthing, Sussex, 1900.

**epiglotomatus** (*ep-i-j-e-mot-ah's*), the name given to him from his birthplace at Königsberg (*Mons Regius*) to the mathematician and astronomer Johann Müller. He was born in 1436, studied at Vienna, and in 1461 accompanied Cardinal Bessarion to Italy to learn Greek. In 1471 he settled in Nuremberg, where, with Bernhard Walther, he labored at the "Alphonsine tables," and published *Ephemerides 1475-1600* in 1473. Died, 1476.

**Regnard** (re'ngär'), **Jean François**, French dramatist, was born at Paris, France, 1655. After a roving and adventurous life in various countries, he returned to France about 1683, and became prominently connected with the ministry of finance. Regnard was one of the best followers of Molière, and is regarded as second only to that great master as an exponent of French comedy. Died, 1709.

**Regnault** (rə'nyəʔ). **Henri**, French figure and genre painter, was born in Paris, 1843. He studied there and at Rome, later making a study of Velasquez in Madrid. His equestrian portrait of Marshal Prim was one of the finest of the century. Regnault enlisted in the army during the Franco-Prussian war and was killed at Buzenval, 1871.

**Légnant, Henri Victor**, French chemist and physicist, was born at Aix-la-Chapelle, 1810. In 1841 he succeeded Dulong as professor of physics in the Collège de France; in 1847 he became chief engineer of mines, and in 1854 director of the porcelain factory of Sevres. He rendered distinguished service to science by his exact determination of physico-chemical constants, and his criticism of the law of Boyle and Mariotte. Died, 1878.

**Régner** (rā'gā), **Mathurin**, French poet, was born at Chartres, 1573. After a life of dissipation he became in 1609 canon of the cathedral of Chartres, and was called "the good Régner," on account of his amiability. Boileau called him the best satirical poet before Molière. He died

at Rome, 1613). **Marcus** **Atilius**, Roman general, was consul in 207 B. C., when he took the **Agri** into Gaul, received a triumph, and in 205 B. C. he was a second time consul, and in conjunction with his colleague, **Manlius**, defeated the Carthaginian fleet of 250 sail under **Hanno** and **Hamilcar**, landed at **Clypea**, and ravaged the coast of **Spain**. **Scipio** the Carthaginian, in 206, defeated him and took him prisoner. After five years' captivity he was sent in 200 B. C. to Rome, along with an embassy, on condition that he would remain a negotiator between Rome and Carthage. He persuaded the Senate to refuse to make peace, and returned to Carthage, where he was put to death.

about 250 B. C.

**Ada** (dā'dā; dā'dā). **Ada**, actress, was born in Limerick, Ireland, 1850. She came to the United States in childhood, made her first appearance on the stage at fourteen, in Newark, N. J., and played in Philadelphia, Baltimore, Albany, and Louisville stock companies. In 1870 she was engaged by Augustin Daly to fill leading positions in Daly's theater, and continued with him until his death, in 1899.

lich (rik), D. Emil, Austrian author and lecturer, was born in Eperjes, Hungary, 1854. He was educated at Prague, Budapest, and Vienna University; J. U. D., Vienna. Author: *History of Civilization; Græco-Roman Institutions*, Oxford lectures; *Hungarian Literature; Foundations of Modern Europe*, etc.

**Nield, Sir James**, British physician, physician-in-ordinary to King Edward and to the prince of Wales, was born in Scotland, 1849. He was graduated at Aberdeen University, M. A., 1869; M. D., 1875; LL. D., 1895; honorary LL. D., Glasgow, 1901. He studied at Vienna, 1876-77; practiced in Scotland, 1877-81; resident physician to Queen Victoria, 1881-1901; physician extraordinary, 1887-89; physician-in-ordinary, 1889-1901.

**Weld, Robert Gillespie**, Canadian railway builder and capitalist, was born in Scotland, 1840. In 1871 he came to America and had charge of the construction of the international railway bridge at Niagara Falls, the international bridge over the Rio Grande, and the Lachine bridge over the St. Lawrence.

son, Thomas, Scottish philosopher, was born at Strathairn, Scotland, 1710. He took his degree at the University of Aberdeen in 1726, and continued to act as librarian there for a number of years. In 1763 he was chosen to succeed Adam Smith as professor of moral philosophy in the University of Glasgow, and henceforth devoted himself to mental and metaphysical speculation, resigning his chair in 1781. In 1764 he published his *Inquiry into the Human Mind*; and in 1788, his *Active Powers of the Human Mind*. Died, 1796.

**Mildred Whitelaw**, American diplomat and journalist, was born at Xenia, Ohio, 1837. He was graduated from Yale University, 1860; married, 1869; moved to New York City, 1870; Princeton, 1879; Yale, 1901; Cambridge, 1902; D. C., Oxford, 1907; aide-de-camp on the staff of General Thomas A. Morris and W. S. Kitchener in India, 1908-1910. He was attached to the editorial staff of *New York Tribune*; managing editor, 1869; editor-in-chief, and chief writer, 1870-1871; assistant manager, 1871-1872; returned to America, 1872; went to France, 1889-92; special ambassador of the United States to Queen Victoria's jubilee, 1897; returned to America, 1898; special ambassador to the coronation of Edward VII, 1902, and United States ambassador to England during the Boer War, 1900-1902. His books are: *Tour; Ohio in the West; Schools of Journalism; Newspaper Tendencies; Town Hall Suggestions; Two Speeches at the Queen's Jubilee; Some Consequences*

**Pinch (rins).** **Paul Samuel**, American educator and author. Professor of political science, University of Wisconsin, since 1899, was born at Milwaukee, Wis., 1862. He graduated from the University of Wisconsin, 1892; Ph. D., 1898. Author: *The Common Law in the Early American Republic*, 1905; *The American Republic in the Nineteenth Century as Influenced by the Oriental Situation*; *Colonial Government*; *Colonial Administration*; *Colonial Development*. Lectured in Europe.

**Rajne (ra'dshān).** **Madame** (Gustavie Rájo), French actress, was born in Paris, 1857. She married **Paul**, director of the Théâtre de la Renaissance, Paris, and was educated at the Paris Conservatoire, under Regnier, and made her debut at the Vaudeville theater in *Revue des Deux* in 1879. She has since played in many theaters and obtained an enormous success. She now manages her own theater in Paris, the Théâtre

**Rembrandt** (rem'brānt), **Van Ryn, Paul Harmens**, a Dutch painter, was born in Leyden 1607, and died 1669. He studied in Leyden and Amsterdam, and about 1623 fitted up a studio in his father's windmill on the bank of the Rhine. In 1628 he executed his first great work, a portrait of his mother, and in 1630 settled in Amsterdam, where he gained great celebrity, and founded a school of art based on the natural style.

His paintings and etchings, exhibiting the most powerful effects of light and shade, brought great prices, and he taught a large number of pupils. He preferred the imitation of vulgar nature to the cultivation of ideal beauty; and his manner depends upon the elaboration of a single element in art, that of *chiaroscuro*.

Among his historical pictures are *The Sacrifice of Abraham*, *The Woman taken in Adultery*, and *The Descent from the Cross*; his portraits include *The Jew Merchant* and *The Night Watch*. His peculiar style is perhaps most strikingly displayed in his etchings, especially in his *Christ Healing the Sick*. He was twice married; his second marriage involved him in difficulties, and he became bankrupt in 1856. He executed over 600 paintings, now variously valued at from \$500 to \$20,000.

**References.**—Bell's *Rembrandt*; Michel's *Rembrandt, his Work, his Life, his Time*; Middlinton's *Descriptive Catalogue of the Etched Work of Rembrandt*; Memphis's *Rembrandt*; and *Study of his work* by E. Michel.

**Remington, Frederic**, American artist, illustrator, sculptor, and author, was born in St. Lawrence county, N. Y., 1861. He early studied at Yale art school, and at the art students' league of New York, after which he led the life of a cowboy and







**Knecht, William Henry**, American sculptor, was born in Carroll county, Md., 1825. He received a common school education, and at the age of twenty-one began his career as a marble worker in Baltimore. In 1855 he went to Italy. He completed Crawford's bronze doors for the capitol at Washington; executed a bronze statue of the Chief Justice, Taney, under a commission from the state of Maryland, unveiled in Annapolis in 1872. He died at Rome in 1874, leaving his property as a fund for the aid of indigent

**Ripley, George**, American scholar and critic, was born at Greenfield, Mass., 1802. He graduated at Harvard College, 1823, and was ordained to the pastorate of a Unitarian church at Boston. This he held until 1841. In the meantime he had become one of the leading spirits in the transcendental movement, the first meeting of the club being held at his house in 1836; and on leaving the pulpit he started the Brook Farm experiment. He was co-editor of the *New American Cyclopedia*. Died, 1880.

**Elipon, Bishop of.** See Carpenter, Rt. Rev. William Boyd.

**Ristori** (*ris-to-ri*), Adelaide, Italian actress, was born in 1821, the child of strolling players. In America she played with Edwin Booth. Her leading parts were: Francesca da Rimini, Marie Stuart, Phedra, Lady Macbeth, Judith, etc.

**Ritter, Karl**, German geographer, was born at Quedlinburg, Prussia, 1779. He studied at Halle, became professor of geography at Berlin in 1820, and afterward member of the academy and director of studies in the military school. With Ritter as the founder of comparative geography, began a new epoch in the history of geographical science. He died at Berlin, 1859.

**Rive (rév), Amelia**, Princess Amélie Troubetzkoy, American novelist, was born at Richmond, Va., 1863. Her earliest production was a series of stories entitled *A Brother to Dragons*. This was followed by a sensational work called *The Quick or*

**the Dead** which met with considerable popularity. **Elvire** (1819-72), **Erison**, English painter, was born in London, 1840, of Huguenot ancestry. He was graduated at Oxford in 1867, M. A., D. C. L. He had exhibited at the royal academy in 1858, and from the appearance of *The Poacher's Widow*, 1866, he has been regularly represented there and at various international exhibitions. He became A. R. A. in 1878, R. A. in 1881.

**Robbia** (rób'byä) Lucca della, Italian sculptor, was born at Florence, about 1400. He decorated the campanile of the cathedral at Florence; made a bronze door for the sacristy of the same; and was famous for his work in enameled terra cotta, since known as "della Robbia's" ware. Died 1482.

known as "della Robbia" ware. Died, 1482.  
 Robert I., king of Scotland. See Bruce, Robert.  
 Robert I., king of France. See Douglis, Robert.  
 Robert, author, was born at Douglas, N. B., Canada, 1860.  
 He was graduated at the University of New Brunswick,  
 1879; was editor of the *Week*, Toronto,  
 1883-84; editor of the *Illustrated American*, in  
 New York, 1897. Author: *New York Nocturnes*;  
*Boys of the Coast*; *The Adventures of*  
*Wood*; *The Kindred of the Wild*; *Barbara Ladd*;  
*The Prisoner of Mademoiselle*; *The Heart that*  
*Knows*; *In the Deep of the Snow*; *The Young*

**Robert, Frederick Sleight**, baron of Kandahar and Waterford, distinguished British general, was born at Cawnpore, India, 1832. He was educated at Eton College, at Addiscombe, and at Sandhurst; D. C. L., Oxford, LL. D., Cambridge. At the age of nineteen he joined the Bengal artillery

and served through the Indian mutiny. For his gallant services during the storming of Lucknow he took part in the Abyssinian war, and was made a C.B. In the Afghan war of 1878 he commanded the British field force which defeated the Afghans at Kandahar, and won the Victoria Cross for his famous march from Kabul to Kandahar, effecting the relief of the latter place. For his gallantry in the battle of Shivanai he was promoted Major-General, and earned from his soldiers the familiar sobriquet of "Little Bobs" or Bobs Bahadur. In 1890 he raised the 1st Buffs as a new regiment, which was made field-marshal and commander of the forces in Ireland. In 1899 he proceeded to South Africa to command the troops sent to assist the Boers, where he invaded the Orange Free State and the Transvaal and turned the fortunes of that country over to the British. After the close of the war he returned to England to succeed Lord Wolseley as commander-in-chief of the army, a post which he held until 1904.

**1904-1906**.—*The Boer War; The Rise of Mafeking; The Relief of Ladysmith; The Siege of Mafeking; and Forty-one Years in India.*

**Roberts, Morley**, English novelist and journalist, was born in London, 1857. He was educated at Owens College, served before the mast, on Australian sheep-runs, on Texan ranches, on California railways, and British Columbian saw-mills, and multiplied his experiences in the South seas, the Transvaal, Rhodesia, and Corsica. Between 1887 and 1904 he published some forty works, mostly novels.

**Robertson, Frederick William**, English pulpit orator and writer, was born in London, 1816. He was educated for the army at Tours and Edinburgh, but subsequently studied at Oxford, 1837-40, and devoted himself to the church. In 1842 he was settled at Cheltenham; in 1847 became incumbent of Trinity chapel, Brighton.

where his earnestness, originality, and wide sympathy arrested attention, but provoked suspicion. He resigned in 1853 because his vicar had refused to confirm his nomination of a curate, and died the same year. His *Sermons* were published complete

Robertson, William, British historian, was born in Northwick, Nidlothian, 1721. He distinguished himself in the general assembly of the church, and became leader of the moderate party. He was one of the ministers of Greyfriars church, Edinburgh, and principal of the university from 1762. He wrote *History of Scotland During the Reigns of Mary and James VI.*; *History of the Reign of the Emperor Charles V.*; and *History of America*. He died in Edinburgh when nearly seventy-one years old, 1793.

**Roberts, William Henry**, clergyman, was born at Holyhead, Wales, 1844; graduated from the College of the City of New York, 1863; and Princeton Theological Seminary, 1873; D. D., Western University of Pennsylvania, 1884, Lafayette, 1907;

L.L. D., Miami University, 1888. Assistant Librarian of Congress, 1866-71; ordained Presbyterian minister, 1873; Librarian Princeton Theological Seminary, 1876; professor of Church History, Lane Theological Seminary, Cincinnati, 1896-98; president Glasgow, Scotland, Pan-Presbyterian Council, 1890; president Inter-church Conference on Federation, New York, 1905; moderator Presbyterian General Assembly, 1907. Author: *History of the Presbyterian Church; The Presbyterian System; Laws Relating to Religious Corporations*, etc.

**Despièrre** (*Des-pyair'*). **Maximilien Marie Isidore**, noted French revolutionist, was born at Arras, France, 1758. He was elected to the National Assembly in 1791, and in 1792 was and recognized chief of the extreme party he was one of the main agents in procuring the execution of Louis XVI. In 1793 he was elected to the 1792. A period of terror followed; Marie Antoinette and the infamous duka of Orleans were the first victims. Despièrre was one of the men whose moulds were next immolated, on a suspicion of having favored a reactionary policy; and for months he was the victim of the most cruel persecutions. Finally, in 1794, he was executed for safety. Marie became the victim of an indiscriminate quasi-judicial slaughter, in which some thousands of lives were sacrificed. A conspiracy was organized against Despièrre in Arras, and he was arrested. At the convention his arrest was accomplished. A rescue by the populace followed, but he refused to take advantage of the opportunity, and, while he hesitated his enemies acted, and in July, 1794, he closed his

**Robinson, James Harvey**, American historian and educator, professor of history, Columbia University, since 1896, was born at Bloomington, Ill., 1863. He was graduated at Harvard, 1887; Ph. D., Freiburg, 1890. Author: *The German Bunderrail; Petrarch, the First Modern Scholar and Man of Letters*, with H. W. Rolfe.

**Johnson, William Calthian**, American educator and legal writer, dean of law school, Catholic University of America, since 1895, was born at New York City, 1845; graduated at Dartmouth College, 1864; graduated in divinity, General Theological Seminary, Protestant Episcopal church, 1867; studied law, and was admitted to the bar in 1864; LL. B., Dartmouth, 1870. He practiced law in New Haven, Conn., 1870-76; judge of city court, New Haven, Conn., 1869-71; judge of court of common pleas, New Haven county, Conn., 1874-76; member of the legislature of Connecticut, 1876-77; author of *Constitutional Law; Elementary Law; Civil Remedy; Law of Patents; Forensic Oratory; Elements of American*

**able, Virginia Huntington**, author and editor, was born at Salmon Falls, N. H., of an old colonial family, and educated in Boston, Mass.; has specialized as a writer on furniture, ceramics and interior decoration; associate editor of *The House Beautiful*. Author of *Interior Decorations*; *Shamrock and Thistle*; *Historic Styles in Furniture*; etc.

at Wigan, Lancashire, England, daughter of Charles Robson. She was graduated at St. Peter's Academy, Satan Island, New York, 1897, and made her professional debut at California theater, 1897. She played Juliet to the Romeo of Kyrie Bellaw, 1903; starred in *Merely Mary Ann*, 1903-05, and headed an "all-star" cast in a special production of *Six Weeks to Conquer*, at the New Amsterdam theater, New York, under Liebler and company, 1905.

**Donatien de Vimeur, Comte de**, marshal of France, was born in 1725. He served in the war of the Austrian succession; distinguished himself in the Seven Years' war, cooperated with Washington at the siege and capture of Yorktown, during which he was taken prisoner. In 1791 he became commander of the French army in the north, but resigned in 1792, and narrowly escaped execution during the reign of terror. Died, 1807. See **La Rocheffoucauld**. **France**.

**Rockefeller, John Davison**, American capitalist and philanthropist, was born at Richford, N. Y., 1839, and moved to Cleveland, Ohio, 1853. He received a public school education; was clerk in

forwarding and commission house, and as nineteenth a partner in the firm of Clark and Rockefeller, commission merchants. Subsequently the firm became Andrews, Clark and company, and engaged in the oil business. In 1865 the firm, with the Standard Oil Co., was organized as the Standard Oil works at Cleveland, and this was consolidated with others in the Standard Oil company, 1870. Other interests were later acquired, and in 1882 the Standard Oil Co. was dissolved, 1892. The various Standard oil companies are now operated separately, with Rockefeller at the head of the entire business. He has given a total of more than \$55,000,000 to

**orchestrator, John Davison, Jr.,** capitalist, son of preceding, was born in 1877. He was graduated at Brown University, and married, in 1901, Abby Green Aldrich, daughter of Nelson W. Aldrich, United States senator from Rhode Island. He is associated with his father in his various business enterprises, and is a trustee of the University of Chicago.

**Bookefeller, William**, capitalist, brother of John Davison, was born at Richford, N. Y., 1841. He was educated at Oswego, N. Y., and Cleveland, Ohio; was bookkeeper and late partner in produce commission trade; soon after joined his brother, John Davison, in oil business, and since 1865 has been at the head of the business in New York.

born at the end of the twenties in New York.  
**Odin** (rô'dan'), **Auguste**, French sculptor, was  
 born at Paris, 1940. He studied under Barye,  
 and began to exhibit in the salon in 1878. He  
 has produced a number of great scriptural and  
 symbolical groups, but is best known by his  
 portrait busts and statues, notably the bust and  
 the monument of Victor Hugo. He is generally  
 acknowledged to be the greatest of living sculptors.

**odner, George Brydges, Lord**, English admiral, was born in 1719. In 1759, after twenty-eight years of active service, he was made rear admiral. In 1762 he became vice admiral, and in 1764 was made a baronet. During the Seven Years' war he accomplished the relief of Gibraltar and Minorca and defeated, near Martinique, the French fleet, under Count de Guichen; took Eustatia from the Dutch, with 250 ships and other booty. He was elevated to the peerage as Baron Rodney, and received a pension of 2,000 pounds per annum for himself and his successors. Died, 1792.

**cebling** (1844-1919), **John Augustus**, American civil engineer, was born in Muhlhausen, Prussia 1845. He emigrated to the United States in 1831, and in course of years became the designer and constructor of many great public works, among them the canal aqueduct across the Allegheny river, and the Monongahela suspension bridge, both at Pittsburgh; the suspension bridge at Niagara; the Ohio bridge at Cincinnati, etc. He died in 1899, having just before projected the bridge over the East river.

**Leobling, Washington Augustus**, American engineer, was born at Saxtonburg, Pa., 1837. He was graduated at Rensselaer Polytechnic Institute, 1857; joined his father in construction of Pittsburgh suspension bridge across Allegheny river. The Brooklyn bridge was undertaken by his father, but the latter's death in 1869 left the entire construction in his hands, and he directed it to completion. He is president and director of the John

tion. He is president and director of the John A. Roebling's Sons company, manufacturers of iron and steel wire and wire rope, Trenton, N. J.

**Röntgen (rân'gen), Wilhelm Konrad**, eminent German scientist, distinguished investigator of physical problems, and discoverer of the "X" or Röntgen rays, was born in the province of Düsseldorf, Prussia, 1845. In December, 1895,

He was communicated to the Würzburg physicist and medical society his remarkable discovery of the new and powerful "X-rays," since known by his name, and in the following month he described his discovery at the celebration of the semi-centennial of the founding of the Berlin physical society. Later he demonstrated the rays in the presence of the emperor of Germany, who decorated him, and Prince Ludwig of Bavaria created him a baron. In 1901 he received the Nobel prize for physics.

**Wade, Henry** Wade, American educator, dean of the law department of Yale University since 1904, was born at Holland Patent, N. Y., 1833. He was graduated at the University of Michigan, 1854; LL. D., Wesleyan University, Conn. He was admitted to the bar, 1877; was professor of law, University of Michigan, 1883-85; dean of same, 1885-90; president of Northwestern University, 1890-1901, and professor of law at Yale, 1901-03. Author: *Illinois Citations*; *Export Treaties*.

**Waters, Randolph**, American sculptor, was born at Waterloo, N. Y., 1825. After following mercantile pursuits for a number of years in early life, he went to Rome to study the sculptor's art. Among the works for which he is distinguished are many memorial statues in different parts of the country. Died at Rome, 1892.

**roland** (*ro'lan'*), **Marie Jeanne**, wife of Jean Marie Roland de la Platière, daughter of Pierre Gratiot Philpon, was born at Paris, France, 1754. Her husband was obliged to flee from Paris, May 31, 1793, and the same night she was arrested and imprisoned in the Abbaye. Summoned before



Recommended to Vincenzo Gonzaga, Duke of Mantua, he was sent on a mission by the duke to Philip III. of Spain, and on that occasion painted several portraits of Spanish noblemen. He also spent considerable time at Venice and Rome making copies for the duke, and executing independent works, which added largely to his reputation. In 1608, after an absence of eight years, Rubens returned to Antwerp on account of the illness of his mother, but about a year later he had accomplished his journey. He intended to return to Mantua, but was induced to remain by the Archduke Albert, governor of the Netherlands.

In 1621 he visited Paris by invitation of Maria d' Medici; and in 1625 completed the series of sketches for the pictures destined to adorn the palace of the Luxembourg. Rubens was sent by the Infanta Isabella widow of the Archduke Albert, on a diplomatic mission to Philip IV. of Spain in 1628; and in the following year on a similar mission to Charles I. of England, by which he was known to the English court in 1630. He returned to Antwerp in 1640.

**References.**—*Stevenson's Peter Paul Rubens*; article in *North American Review* (November, 1900) by Benjamin Constant; *Early Flemish Painters*, by Sir J. A. Crowe; and *Original Unpublished Letters of Philippe Rubens*, by Sir Peter Paul Rubens, by W. Norton, 1891.

musicians, by the name of the composer, **Antony Gregor**, Russian composer and pianist, was born at Wechotyets, near Jassy, in Russian Bessarabia, 1829. At Berlin he studied composition under Dehn. In 1872-73 he visited America, and after 1867 he spent his time in traveling and composing. As a pianist he was the only rival, technically, that he had ever had, and as a composer he worked in the style of Chopin, with a wonderful fertility of imagination, and many of them by a gorgeous original coloring. Died, 1894.

**Rudolf**, or **Rudolph I.**, founder of the Hapsburg Imperial dynasty, was born at Schloss Limburg in the Breisgau 1218, and, becoming a warm partisan of Frederick II., increased his possessions by inheritance and marriage, until he was the most powerful prince in Swabia. In 1273 the electors chose him German king. Rudolf did much to suppress the robber knights. He died at Spire in 1291.

**Rudolf, or Rudolph II.**, born at Vienna, 1552, eldest son of the emperor, Maximilian II., became king of Hungary in 1572; king of Bohemia, with the title "king of the Romans," in 1575; and emperor on his father's death in 1576. He died in 1612 after an inefficient reign.

**Lundberg** (roo-ne-ber'y), **Johan Ludwig**, national poet of Finland, was born at Jacobstad, 1804. He was educated at the University of Åbo, where he afterward lectured. His epic *Idylls*, *The Elk Hunters*, *Christmas Eve*, his epic *King Fjalar*, *Fänrik Ståls Sägner*, etc., are the finest poems in the Swedish language, and are characterized by repose, simplicity, artistic finish, and the warmth of national life. He died in 1877.

**Boff, Henry Waldmar**, editor, author, was born in Germantown, Pa. 1867, and was graduated from Indiana University 1900; post-graduate work at University of Chicago, 1901; anthropology and comparative religions, and at Columbian (now George Washington) University, two years, 1902-03; Ph.D., 1904. Editor, *Journal of American Geography*, D. C. L. E. Columbian, 1901, George Washington, 1907; *Litt.* L. 1910. Assistant in anthropology, University of Chicago, 1901; instructor in psychology, logic, ethics and philosophy of history, Pennsylvania State College, Audubon, 1903-04. *Journal of American Geography*, 1904-05. *Ecology and Sciences Politiques*, Paris, in comparative politics and jurisprudence, 1901-2. Associate editor, *Journal of American Geography*, 1905-06. *Journal of American Geography*, 1907-78. Member American academy of political and social sciences, national geographical society. Has traveled extensively in Europe, Asia, Africa, and Australia. Editor: *Home and State; Woman in the Middle Ages; Century Book of Facts; Constitution of the United States; The American People; The American Leaders of Men; Universal Cyclopaedia Handbook; The Standard Dictionary of Facts; Masters of Action*.

**Maxwell, The Volume Library, etc.**  
**Musart, James**, English, a third son of the first Viscount of Salm, was born at the point of Frederic's death, and Elizabeth's daughter of James I. of England, was born at Prague, 1619. In 1642 he returned to England and for the next three years was in the service of the king, and now, as the royalist cause, winning many a battle by his resistless charges, to lose it as often by a too headlong pursuit. In 1645 his surrender of Bristol to Cromwell, and his flight to France, created him duke of Cumberland and a generalissimo, that he dismissed him. A court-martial, however, cleared him, and he returned to his duties. In 1650 he was again in France, but in 1652 he was recalled to England. He now took service with France, but in 1648 accepted the command of that portion of the English fleet which had espoused the king's cause. He was killed at the battle of Beachy Head, a few days later. He died in 1682.

**Rush, Benjamin**, American physician, was born near Philadelphia, Pa., 1745. He was graduate at Princeton in 1760, studied medicine at Edinburgh and at Paris, and became professor of chemistry in the Philadelphia College of Medicine. He was a founder of the Philadelphia dispensary, the first in America, and of the college of physicians, and was given several medical professorships besides the one he already held at Philadelphia. Among his medical writings are: *Medical Inquiries and Observations; Essays; and Discourses of the Mind*. He died at Philadelphia, 1813.

**Foster, John.** An architect and writer on art; was born in London, 1819. He studied at Christ Church, Oxford, where he graduated Bachelor of Arts in 1839, and took his degree in 1842. The year following appeared as first prize in the Royal Academy's annual competition for the Paine Prize. His primary mode of landscape painting was by water-colours. In 1846 he published *The Seven Lamps of Architecture*, and from 1851 to 1863 *The Stones of Venice*, both being important contributions to the study of the significance of domestic architecture. About 1860 he became deeply interested in the social problems of the day, and wrote *Socialism and Manners* (London). Among his later works are: *Seas and Lakes; The Ethics of the Dust; The House of the Future*. He died in 1875. His autobiography, completed in 1888. He was also selected Slade professor of fine arts at University College, London, in 1873, and held the post in 1884 on account of failing health. For several years prior to his death he lived in retirement.

**Russell, Annie**, actress, was born in Liverpool, England, 1869, and made her first stage appearance at Montreal, Quebec. She afterward appeared in New York in *Pinefort*, was in South America and West Indies in varied repertory; She has since appeared as a star in *Miss Hobbs*, *A Royal Family*; *The Girl and the Judge*; *Mice on Men*; *Jimmy the Carrier*; *Brother Jacques*; *Majesty Barbara*; *Midsummer Night's Dream*, etc. She married Oswald Yorke, an English actor, 1904.

**Russell, James Earl**, American educator, dean of Teachers College, Columbia University, since 1898, was born at Hamden, N. Y., 1864. He was graduated at Cornell in 1887; Ph. D., Leipsic, 1894; professor of education, Teachers' College, since 1897; and Barnard professor of education, Columbia, since 1904. Author: *The Extension of University Teaching in England and America*; *German Higher Schools*.

**Russell, John Earl**, British statesman, third son of the sixth duke of Bedford, was born in 1792. He was educated at Westminster and Edinburgh, entered parliament as a Whig in 1813; became secretary of the treasury, 1823; and was instrumental in the repeal of the test and corporation acts in 1828, and the passing of the Catholic relief act in 1829; led the opposition, 1841-44; was prime minister, 1846-52; went as British plenipotentiary to the Vienna conference, 1855; was foreign secretary under Lord Palmerston, 1855; again became prime minister in 1859, but resigned on the defeat of his reform bill, 1860. **Died**, 1878.

**Kuyter** (ro'i'tér; rú'tér), **Michael Adriaanszoon** de, Dutch admiral, was born at Vlissingen in 1607, of poor parents, who sent him to sea as a cabin-boy when only eleven years old. He became a warrant officer, and in 1637 rose to be captain in the Dutch navy. After serving several years in the Indian seas he was, in 1641, made rear admiral. He had his legs shattered in an engagement off the coast of Sicily, and died of his wounds in 1676.

of Builly, and died for his wounds in 1678.  
 1680. **St. John's.** **John** (John) **Rome**  
 Catholic archbishop, was born at Thurles, County  
 Tipperary, Ireland, 1831. He was graduated  
 Coler College, 1852; LL. D., University of New  
 York and University of Pennsylvania. He was  
 chaplain of the Gratiot state military prison and  
 of the U. S. Army, 1861-62. He was rector and  
 rector of Annunciation church, delivered lectures  
 in English at Rome, 1868, on invitation of  
 Pope Pius IX. He was consecrated, 1872, titular  
 bishop of Tricomia in Palestine and made co-  
 adjutor bishop of the same province, and was  
 consecrated, 1883, and in June, 1885, was transferred  
 to the see of Philadelphia, Died 1911.

**Ryan, Thomas Fortune**, American financier, was born in Nelson county, Va., 1851. He began business life, 1868, in a Baltimore dry goods house; entered Wall street, 1870, and became a member of the New York stock exchange, 1874. He was vice-president of the Mortuam trust company; director of the Seaboard air line railway, American Tobacco company, Fifth Avenue trust company, Industrial trust company of Providence, and many other corporations; and purchased a controlling interest of the stock of the Equitable life insurance society of the United States in 1900.

**Sachs** (saks), Hans, noted German poet, was born at Nürnberg, 1494. He was the son of a tailor and by trade a shoemaker. He learned "the mystery of song" from a weaver. In 1568, examining his stock for publication, he found that he had written over 6,000 pieces, among them 208 tragedies and comedies. He sank in oblivion during the seventeenth century, but his memory was revived by Goethe in the eighteenth. He died in 1576.

**Sachs, Julius von**, botanist, was born at Breslau 1832. In 1867 he became professor of botany at Freiburg, and in 1868 at Würzburg. There he carried on important experiments, especially as to the influence of light and heat upon plants, and the organic activities of vegetable growth. He wrote extensively on botany, and is considered the founder of experimental vegetable physiology. Died at Würzburg, 1897.

**Sacy (sá'sé), Antoine Isaac, Baron Silvestre de**, was born in Paris, France, 1758. He was appointed in 1793 professor of Arabic in the school of oriental languages, and in 1806 of Persian in the Collège de France, besides which he held various other appointments. He founded the Asiatic society in 1822; was created a baron by Napoleon I., and entered the chamber of peers in 1832. His writings gave a stimulus to oriental research throughout Europe. He died in 1838.

**Sadi-Carnet.** See **Carnet.**  
**Sadi (ad-ad')** Persian poet, was born at Shiraz, about 1184. He studied science and theology at Bagdad, and from there made the first of fourteen pilgrimages to Mecca. He is called the "nightingale of a thousand songs," and the catalogue of his works contains twenty-two different kinds of writing in prose and poetry, in Arabic and Persian. Died, 1291.

**Sagasta** (*sá-gás-tá*). **Praxedes Mateo**, Spanish statesman, was born in 1827. He was obliged to leave the country for his share in the rising of 1856, and again, ten years later, to seek refuge in France. After the accession of Alfonso XII., he became president of the cortes, formed a liberal constitutionalist party, and having, in 1880, joined a new liberal combination, formed a coalition with Campos, which lasted until 1883.

**Sage, Russell**, American capitalist, was born in Oneida county, New York, 1816. Educated in the public schools, he became a grocer's clerk, and established himself as a wholesale grocer in Troy, 1839. He was a member of congress, 1852-56, removed to New York in 1863, purchased a seat on the stock exchange and associated himself with Jay Gould in extensive rail-

way operations, gaining a wide reputation by his close bargaining and successful speculation. His fortune was variously estimated at from \$50,000,000 to \$100,000,000. Died, 1908.

**Sage, Margaret Olivia Slocum**, philanthropist, was born at Syracuse, N. Y., 1828, daughter of Joseph Slocum; in 1859 married Russell Sage, at Watervliet, N. Y. She has given many millions of dollars to charitable and educational institutions.

**Saint Ambrose.** See *Ambrose*.

**Saint Ambrose.** See **Ambrose.**  
**Saint Augustine.** See **Augustine St.**  
**Saint Basil.** See **Basil.**  
**Saint Benedict.** See **Benedict.**  
**Saint Bernard.** See **Bernard.**  
**Saint Clair, Arthur.** American general, was born in Scotland, 1735. In 1777 he became major-general, and entered congress in 1785, of which body he was elected president two years later. In 1789 he was made governor of the Northwest territory.

He was Indian governor of the Northwest territory, and two years afterward suffered a defeat with heavy loss, at the hands of the Miami Indians. Died, 1818.

**Saint Columba.** See **Columba.**  
**Sainte-Beuve** (sant'êv'), **Charles Augustin**,  
 French literary critic, was born at Boulogne-sur-  
 Mer, 1804. In 1827 he became acquainted with  
 Victor Hugo, whose commanding influence drew  
 him into the romantic movement, and determined  
 for him a literary career. In 1837 he lectured at  
 Lausanne on Port-Royal, and these lectures con-  
 tain some of his finest writings; was elected in 1845

to the academy; and three years later lectured for a season at Lige University. During 1849-50 he contributed to the *Constitutionnel*. These contributions form his famous *Coursiers de Louvi* and his *Essai sur l'histoire de la philosophie*. His interest, critical insight, and breadth of sympathy, remain unsurpassed. He was elected a senator in 1865, and his popularity revived by his eloquent advocacy of freedom of thought. In precision, in subtlety, and in delicacy, his works, fifty-three volumes in all, stand alone in the literature of

**Saint Francis of Assisi.** See Francis St.  
**Saint Gaudens** (*saint gô'drân*), Augustus, American sculptor, was born in Ireland in 1848, and was brought to the United States in infancy. During 1861-66 he was a student at Cooper Institute, and at the academy of design, New York; went to Paris and studied at the Ecole des Beaux Arts under Jouffroy. He executed a number of notable

works, of which the most important are: *The Puritan*; *Paraguay*; *Lincoln*; *Peter Cooper*, New York; Colonel R. G. Shaw, Boston. He was awarded medals at the Paris, Buffalo and St. Louis expositions, and made an officer of the French legion of honor. Died, 1907.

**Saint Jerome.** See **Jerome**.

**Saint Louis IX.** See **Louis IX.**

**Saint Paul.** See **Paul**.

**Saint Peter.** See **Peter**.

**Saint Bernard.** See **Bernard**.

**Saint-Pierre** (sən'pîyər'), **Jacques Henri Bernardin** de, French writer, was born in Havre, France, 1737. He is best known for his beautiful story, *Paul and Virginia*, which has been translated into many languages. He died at Eragny-sur-Oise, 1814.

**Saint-Saëns** (sən'sāns'), **Charles Camille**, French composer and pianist, was born at Paris, 1835.



thence after a few months he went to Dresden, where he began the practice of composing during the night, which so fatally assisted in shortening his life. *Der Geister-seher* was written here, and the drama of *Don Carlos* was completed.

In 1787 he was invited to Weimar, where Goethe and he became the closest friends. Henceforth Schiller owed more to Goethe than to all other men. His *History of the Thirty Years' War* originally appeared in the *Sachsenkalendar* or *Year-Dameter*. On the occasion of the poet's marriage in 1790 with Charlotte von Lengefeld, the Duke of Meiningen made him a privy-councillor; the French republic also conferred on him the right of citizenship; and in 1802 the emperor raised him to the rank of nobility.

While staying for a year with his relatives in Württemberg, he wrote his exquisite letters on aesthetic culture. After 1795 the finest of his lyrics and dramas were produced—as *Der Spaziergang* and *die Lied von der Glocke* (Song of the Bell), Wallenstein, *Maria Stuart*, *Die Jungfrau von Orléans*, *Braut von Messina* and finally his *Wilhelm Tell*. He died 1805.

**References.**—In English we have the famous biography by F. Colburn (1810), and the excellent one by James Sime, H. Nevins, and T. Calvin. For evidence the following are of importance: E. Dowden's *Schiller's Friendship with Goethe*; F. Werner's *The Characteristics of Schiller's Drama*; and G. Schlegel's *Works illustrated by the German Artists*.

**Schlegel** (shô'pû), **August Wilhelm** von, German critic, poet, and scholar, was born at Hanover, 1767. In 1800 he published his first volume, a poem; and, in company with his brother, Friedrich Schlegel, he edited the *Wendekunst*, a valuable and most widely popular work was his *Lectures on Dramatic Art and Literature*, originally published in 1804, and which has since been translated into most European languages. In 1818 Schlegel, now ennobled, was appointed professor of history in the University of Bonn, and continued to devote his time to literary, historical, and philological research. He was one of the first students of Sanskrit in Germany, established the first printing press at Bonn, and an *Indische Bibliothek*, Diehl, 1845.

**Schlegel, Karl Wilhelm Friedrich**, German critic and author, brother of the preceding, was born at Hanover in 1772. He studied at Göttingen and Leipzig, and in 1797 published his first work, *The Greeks and Romans*, followed in the course of a year by his *History of Greek and Roman Poetry*. In 1808 he went to Vienna, where, in 1811, appeared his *Lectures on Modern History*, and in 1815 his *History of Ancient and Modern Literature*.

<b>Schleiermacher</b> (shl'f-er-mä'k'ir). <b>Friedrich</b> <b>Ernst</b> Daniel, German philosopher and theologian. Born 1768 in Breslau. In 1794 he became assistant clergyman at Landsberg-on-the-Warthe, where he remained for two years. The first work that won for him general recognition was <i>On Religion</i> , published in 1804. He returned from its spiritual torpor. He was professor at Halle, 1804-06, and in 1810 was called to a theological chair at Berlin. He was the author of <i>On Religion</i> (1811) appeared his <i>Brief Outline of the Study of Theology</i> . In 1817 his <i>Critical Essay on the Writings of Luther</i> ; and in 1821-22 his greatest work, <i>On Religion</i> , of which he published a second edition in 1830. He died in 1834.	<b>Principles of the Evangelical Church</b> . Died, 1834.
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**Scley** (sArl), **Winfield Scott**, American admiral, was born near Frederick, Md., 1839. He was graduated from the United States Naval Academy, 1860; served in West Gulf blockading squadron, 1861-62; in 1863, he was promoted to be lieutenant. In 1864 he was promoted to be lieutenant commander of the department of modern languages at Annapolis. In 1884 took command of Greeley relief expedition and rescued Lieutenant Greeley and his survivors from the wreck of the ship. He was in command of the "flying squadron" on duty in Cuban waters in war with Spain; was in immediate command at the destruction of Cervera's fleet on Santiago, July 3, 1898. Promoted to admiral, April, 1900. He received the Medal of Honor for his gallant and heroic services in the war with Spain; a gold sword by the people of Pennsylvania; a silver sword by the Royal Arcanum; a gold and jeweled medal, with the thanks of the Maryland Legislature.

**Schliemann** (sh'lan), **Heinrich**, German traveler and archaeologist, was born at Mecklenburg-Schwerin, 1822. He excavated the ancient city of Troy in 1870, and in 1876 he began excavations on the site of the ancient city of Mycenae, in Greece, and the treasures found there are now preserved at Athens. He wrote an account of his work in *Mycenae, Tiryns, Ilios, Troja*, and other volumes. He died at Naples, 1890, and was

**Schmidt** (schmī), Nathaniel, professor of Semitic languages and literature at Cornell since 1898, was born at Hudiksvall, Sweden, 1862, and educated in the University of Stockholm, and at

Berlin. He was professor of Semitic literature at Colgate, 1888-96, and has gained an international reputation as a student and critic of Semitic and biblical literature.

**Chesfield (aké/fild), Jerry McAllister**, American general, was born in Gerry, N. Y. 1831. He was graduated at West Point in 1853, and served in the war in 1855; L. D., China, 1858-60; and in the war in 1861-62. When the civil war broke out, he entered the army as major of the 1st Missouri Cavalry, and was promoted to lieutenant colonel, and was in most of the battles which ended with the taking of Atlanta, when he returned to Tennessee, defeating Hood at Franklin, and was promoted to major general. He was killed in 1865. In 1868 he became secretary of war, and major-general in the regular army. Upon the death of General Sheridan, 1868, he succeeded to the command of the Sixth Army Corps. In 1870, on his retirement, he was by act of congress, made lieutenant-general, 1875. He published a biographical and narrative entitled *Forty-six Years in the Army*, New York, 1906.

**ethnologist.** **Henry Rowe,** American ethnologist and explorer, was born at Watervliet, N. Y., 1793. After studying at Watervliet Academy, he went to the University of the Mississippi, and also acted as geologist in an exploring expedition to Lake Superior and the upper Mississippi under the command of General Cass. He secured the first treaties that gave the United States 16,000,000 acres. As a member of the legislature of Michigan he was instrumental in securing the organization of the American Ethnological Society. An expedition which he commanded in 1832 discovered the sources of the Mississippi. His works include narratives of his journeys: *Travels in the Westward of the Rocky Mountains, Thirty Years with the Indian Tribes; and The Indian in His Wigwam*. He died at Washington.

**Schopenhauer** (shô'pen-hau'er), Arthur, German philosopher, was born at Dantzig, Germany, 1788. He studied first at Göttingen and afterward at Berlin and Jena. He then proceeded to Dresden, where he published a treatise, *Sight and Color*, which was followed three years later by his great work, *The World as Will and Idea*. Died, 1860.

**Chouler (akó-lér), James**, American lawyer and historian, was born at Arlington, Mass., 1839. He was graduated at Harvard, 1859; LL.D., National University, 1891, Johns Hopkins, 1902. He was admitted to the Massachusetts bar, 1862, and to the supreme court of the United States, 1867; and lecturer, Johns Hopkins, Baltimore, *Austrian The Law of Domestic Relations The Law*

Author: *The Law of Domestic Relations; The Law of Bailments; The Law of Personal Property.*  
 Schubert (*schü'bért*). Franz Peter, Austrian composer (1797-1828). His music, especially his compositions soon revealed itself, and by 1813 his supreme gift of lyric melody showed itself in the song *Th. Erlking*, the *Mass in F*, etc. His output of work was remarkable for its variety and quantity, embracing some 600 songs, ten symphonies, six masses, operas, sonatas, etc.; but his fame rests on his songs, which are infused by an intense feeling of the life of the people.

**Schumann** (*shū'mdn*). **Robert**, German composer, was born in Zwickau, 1810. He studied at Heidelberg, 1828-30, and then at Leipzig under Wieck. Up to 1840 nearly all his compositions had been for the piano, but he subsequently produced 138 songs, many of which have become classic. In 1850-53 he was director of music at

**Dehmann-Heink** (*shō'mén hīngk'*), **Ernestine**, née **Roeseler**, German dramatic contralto, was born at Lieben, 1851. She studied at Gratz, and made her debut at Dresden, 1878. In 1883 she went to Hamburg, in 1896 sang at Bayreuth. She married Heink in 1883, and sang with him in 1896. She sang the American debut in 1898; since then she has devoted herself largely to concert work. In 1905 she bought a large estate at Montclair, N. J.

**Schurman (Schürman), Jacob Gould**, American educator, president of Cornell University since 1892, was born at Freetown, Prince Edward Island, 1837. He was educated at the University of London, 1877, studied at Paris and the University of Edinburgh, 1877-78; D.Sc., Yale University; LL.D., Columbia University, 1892, Yale University, 1901; University of Edinburgh, 1902. He was the last of a line of distinguished scholars, latter part of time dean of Sage school of philosophy, Cornell. Author: *Kantian Ethics* and the *Ethics of Evolution*; *The Ethical Import of Darwinism*; *Belief in God*; *Agnosticism and Religion*; *A History of Philosophy*; *Report of the Philosophy Committee*.

**Lehrer, (Albert).** Carl, American publicist; was born in Liblar, near Cologne, Germany, 1829. He was educated at the gymnasium, took part in the revolutions of 1848, and was expelled from the University of Bonn; L.D., Harvard; college part of the revolutionary army, but finally had to flee to Switzerland. Came to the United States, 1852; settled in Watertown, Wis.; United States minister to Spain, 1857; resigned, 1860; secretary of the Wisconsin Central, 1862; major-general, 1863; and commanded a division at the second battle of Bull Run and at Chancellorsville, and a corps at Gettysburg. After the war he was secretary of the Wisconsin Central, 1865-66; Tribune, 1865-66; and United States senator from Wisconsin, 1869-71.

Missouri, 1859-75. He was one of the organizers of the liberal party, 1872; supported Hayes, 1876; was secretary of the interior, 1877-81. Author: *Speeches; Life of Henry Clay; Abraham Lincoln, an Essay*, and an autobiography published in *McClure's Magazine*, interrupted by his death in 1906.

**Schwab (Auld), Charles M.**, American capitalist, ex-president of the United States steel corporation, was born in Williamsburg, Pa., 1862. He was educated in the village school and at St. Francis College; entered service of Carnegie company as stake-driver in engineering corps of Edgar Thompson steel works; became superintendent of Homestead works and finally president of Carnegie steel company, limited. He built the new Catholic church, costing \$150,000, at Loritto, Pa.; established an industrial school at Homestead, Pa., etc.

**Schwanthaler** (shwa'n'ts-lar), **Ludwig von**, German sculptor, was born at Munich, 1802. He studied under his father, and after a visit to Rome was charged by King Louis of Bavaria to execute bas-reliefs and figures for the public buildings of Munich. Among his works are the colossal statue of *Basaria*; statues of Goethe, Jean Paul

Richier, Mozart, etc. He died in 1848.  
**Selipo** (sip'-lō). **Emillanus Fabilius**, surnamed  
 Africenus Minor, was born about 185 B. C. After  
 distinguishing himself in Spain, he proceeded to  
 Africa to take part in the third Punic war. Here  
 he laid siege to Carthage, took it by storm, and  
 leveled it with the ground in 146 B. C. He was  
 afterward sent to Spain, where he captured Numan-  
 tia after a stubborn resistance, to the extension of  
 the sway of Rome. Died 129 B. C.  
**Selipo**. **Fabilius Cornelius**, surnamed Africenus  
 Major, celebrated Roman general, was born about  
 247 B. C. He was slain at the battle of Zama in

237 B.C. In 212 B.C. he was elected aedile, and in 209 B.C. he was elected consul, with command of the Roman forces in Spain. His defeat of Hannibal at Baecula, with heavy loss. In 205 B.C. he returned to Rome, where he was elected consul, and in the following year sailed for Lilybaeum, in Sicily, at the head of a large army, for the invasion of Africa. His success was followed by a Carthaginian embassy to negotiate peace with Hannibal from Italy. Peace was concluded the following year, when Scipio returned to Rome, and enjoyed a triumph. His laurels, however, did not protect him from the intrigues of his enemies in Rome. Various charges were brought against him, but he was acquitted, and he returned to his country seat at Liternum, where he died, 183 or 185 B.C.

Scott, Sir George Gilbert, British architect, was born at Gawcott, near Buckingham, England, 1811. He was indentured to a London architect, 1827-30, and eventually became the leading architect of the Gothic restoration in England. He was elected A.R.A. in 1855, R.A. in 1861; held the professorship of architecture at the London Academy; and was knighted in 1872. He died in 1878, and was buried in Westminster.

Scott, **James Brown**, American lawyer and educator, was born at Kincardine, Ontario, 1860. He was graduated at Harvard, and studied international law, 1891-94; J.U.D., Heidelberg, 1894. He practiced law at Los Angeles, Cal., 1894-99; professor of law, Columbia Law School, 1903-06; professor of law, 1905-06, and of international law, since 1906, in George Washington University. He has been solicitor for the department of state since 1906. Author: *Cases on International Law*; *Cases on Quasi-Contracts*; *Cases on Equity Juris-*

**Scott, Richard William**, Canadian senator and Dominion secretary of state since 1898, was born in Ontario, Canada, 1823. He was educated at Prescott, became member of parliament for Ottawa, 1857-63; speaker of the house of commons, 1871; appointed to senate, 1873; secretary of state, 1873-78; and leader of the opposition in the senate, 1879-96. He carried through parliament the school bill giving the Roman Catholics right to establish separate schools, 1863, and the *Canadian Education Act*, 1876.

**Scott, Sir Walter**, Scotch novelist and poet. He was born in Edinburgh, 1771. He came of an old border family. Though he matured early, he was feeble and sickly, and was smitten with a lameness which remained with him throughout his life. In 1783 he entered Edinburgh University, and remained there three years. In 1786 he was articled apprentice to his father, by whose office he worked as a clerk until 1792. In that year he was called to the bar, and

In his profession he had fair success, and in 1797 he was married to Charlotte Margaret Carpenter, a lady of French birth and parentage. Toward the end of 1799, through the interest of his friends Lord Melville and the Duke of Buccleuch, he was made sheriff-depute of Selkirkshire, an appointment which brought him 300 pounds a year, with not very much to do for it. Meantime, in a tentative and intermittent way, his leisure had been occupied with literature, which more



**Shakespeare, William**, the chief literary glory of England, was born at Stratford-on-Avon, in Warwickshire, 1564. His father, John Shakespeare, seems to have belonged to the cloth of gold. His mother, Mary Arden, was of more distinguished origin, and came of a good old Warwickshire family. Of a family of four sons and four daughters, he was the second and the youngest child. At the free grammar school of Stratford there can be little doubt the young Shakespeare received his entire education. He was married to Anne Hathaway of Shottery, a girl about eight years older than himself. The children born of the marriage were three boys and two girls. The boy Hamnet died in his twelfth year.

At the age of twenty-two, Shakespeare went to London. No certain details have come down to us as to his earlier relations with the London theater. According to one tradition, he was content at first to turn a penny by holding horses at the door. According to another—which seems a natural sequence with the foregoing—we find him admitted inside on his promotion, though as yet only a member of the humble category of prompter. At any rate, his time was thus occupied. At what time, and for how long, it could have been only for a brief period, as very speedily we have note of him as a man of some importance, at once dramatist, actor, and shareholder in the Blackfriars theater.

In the year 1592 we find a contemporary and brother dramatist, Henry Chettle, apologizing to Shakespeare for an offense given, in terms most respectfully appreciative of his earlier work, at one of the meetings of the company, and in 1698 Francis Meres, in his *Wife's Treasury*, writes of him as the "most excellent among the English for both kinds of tragedy and comedy." We have ample evidence of the unrivaled position which he has attained from all classes; they brought him special marks of favor and approval from Queen Elizabeth and her successor James, and the nobles of the court, and the friendship of some of the most accomplished men of rank of the time, more notably, Henry Wriothesley, earl of Southampton, to whom he dedicated *Lucrece* and *Antony and Cleopatra*, and Kap. Sir Thomas Wroth and William Herbert, earl of Pembroke, to whom his *Sonnets* are addressed.

His visits to Stratford now became more and more frequent; and prior to the year 1613 he had ceased to reside in London, and finally established himself at Stratford. Of his last years there spent, further than that he was a peace-loving man, and the exercise of a liberal and kindly hospitality, nearly nothing is known. There is a good reason to believe that, though withdrawn from other active concernment with the stage, he still continued to write for it. His death took place on his fifty-third birthday, 1616, and he was buried in Stratford churchyard.

He was essentially a man of noble and estimable character, and was obviously of most kindly and lovable disposition; his pleasurable wit and good nature made him delightful as a companion; and it was as a man of full and liberal views that he was familiarly known to his contemporaries. The lofty eulogy of Dryden, "was the man who, of all modern and perhaps ancient poets, has the largest and most comprehensive soul," has been generally acquiesced in. As a poet, he is usually held to be unequalled without a peer; as poet, there are but one or two names in literature even to be named beside his; and dismissing his claims in either kind, we have in his works such a treasury of good wisdom on all matters of human government as no other writer has ever left to the world.

**References.**—Halliwell-Phillips: *Outlines of the Life of Shakespeare*; Sidney Lee's *Life*; Halliwell's *Characters of Shakespeare's Plays*; Ullrich's *Shakespeare's Dramatic Art*; Hudson's *Shakespeare: His Life, Art, and Character*; Dowden's *Shakespeare, His Mind and Art*; Bayne's *Shakespeare Studies*; Swinhurce's *Study of Shakespeare*; White's *Studies in Shakespeare*; Moulton's *Shakespeare as a Dramatic Artist*; Brandes' *William Shakespeare*; Smith's *Eighteenth Century Essays on Shakespeare*; Stopford Brooke's *Ten Plays of Shakespeare*; Gervinus's *Shakespeare*.

**Schaler** (shā'tēr). **Nathaniel Southgate**, American scientist, author, was born in Newport, Ky., 1841. He was graduated at Lawrence Scientific School, Harvard, 1862; Sc.D., 1865; served two years in the artillery, and then joined the civil war. Professor of paleontology, 1868-77, and afterward professor of geology, Harvard; 1877-1882. He was in charge of the geological survey of the Atlantic division of the United States Geological survey. Author: *A First Book in Geology: Kentucky*, a Pioneer Commonwealth; *Sea and Land in Kentucky*; *Geology of the Mountains of the American Commonwealth*; *American Highways*; *Features of Coasts and Oceans*; *Domesticated Animals of the World*; *Man, The Individual*; *Study of Life and Death*; etc. D. 1909.

**Sharpless, Isaac**, American educator, president of Haverford College since 1887, was born in Chester county, Pa., 1848. He was graduated at the Lawrence Scientific School, Harvard, 1873; Sc.D., University of Pennsylvania; LL.D., Swarthmore College; professor of mathematics and astronomy, 1879-84, and dean, 1884-87, of Haverford College. Author: *Astronomy*; *Geometry*.

**Shaughnessy, Sir Thomas George**, Canadian railway president, was born at Milwaukee, Wis., 1853. He received a common school education; entered the railway service in 1869, in the purchasing department of the Chicago, Milwaukee and St. Paul railroad. Vice-president and director, 1891-98, and president since 1898 of the Canadian Pacific railway. He was knighted by Queen Victoria in 1900.

Shaw, Albert, editor of the *American Review of Reviews*, was born in Shandon, Ohio, 1857. He was graduated at Iowa College, Grinnell, Ia., 1879; Ph.D., Johns Hopkins, 1884; LL.D., University of Wisconsin, 1904. He is a member of numerous learned societies, and has lectured in many Universities and colleges. Author: *Isaria—A Chapter in the History of Communism*; *Manic*

**Shaw, George Bernard**, British dramatist, critic, and novelist, was born in Dublin, Ireland, 1856 and came to America in 1892 to work on a newspaper. He published a few novels, wrote musicalcritiques in the *London Star*, 1888-90, and in the *World*, 1890-94; and, in 1895, began his work as a dramatic critic, writing in the *Saturday Review*. In 1898 he published *Plays, Pleasant and Unpleasant*. Since then his chief literary work has been criticism for the *Times*. His plays include *Man and Superman*; *John Bull's Other Island*; *Major Barbara*; *The Doctor's Dilemma*; *Cæsar and Cleopatra*; *Getting Married*, etc.

**Shaw, Henry Wheeler**, American humorist. was born in Lancaster, Mass., 1818. In 1859 he began to write, and, in 1860, sent *An Essay on the Mue*, to *Josh Billings* to a New York paper. It was reprinted in several comic journals, and extensively copied. His most successful literary work was his humorous story, *Uncle Abner*, a travesty on the *Old Farmer's Almanac*. He began to lecture in 1863, and, for twenty years previous to his death, contributed regularly to the *New York World*. Died in Monterey, Cal., 1885.

**Shaw, Leslie Mortimer**, American financier and lecturer, was born at Morristown, Vt., 1848. He was graduated at Cornell College, Mt. Vernon, Ia., M.B., 1874; LL.D. He was admitted to the Iowa bar in 1876, and began practice at Denison, Ia.; subsequently engaged in banking at Denison.

Manilla, and Charter Oak, Ia. He was twice elected governor of Iowa, 1898-1900, 1900-02; secretary of the treasury, 1902-07, and president of the Chicago Board of Trade, 1907-12. He was born in Shays, Daniel, American insurgent, was born in Hopkinton, Mass., 1747. He served as ensign at the battle of Bunker Hill; attained the rank of captain in the continental army, and took a leading part in it. He was a member of the Massachusetts for the redress of alleged grievances due to misgovernment. In 1786 he appeared before Springfield, Mass., at the head of 1,000 men, to prevent the session of the supreme court at that place. He died in Sparta, N. Y., 1825.

[illegible]

Sheley, Mary Wallstonecraft Godwin, wife of the poet, was born in London in 1798, and married Shelley in 1816. In 1818 she produced a remarkable novel entitled *Frankenstein*. She likewise

wrote *Rambles in Germany and Italy*, etc., and carefully edited her husband's poems. Died in London, 1851.

**Shepard, Edward Morse**, American lawyer and publicist, was born in New York, 1850. He graduated at Columbia college of the city of New York, 1869, studied law and was admitted to the bar. He was civil service commissioner of Brooklyn, 1883-85; New York state forestry commissioner, 1884-85, and democratic candidate for mayor of Greater New York, 1901. Author: *Martin Van Buren in American statesmen series; Memoirs of Dugdale*; and many review, magazine and other articles and addresses on political, industrial and educational topics.

**Shepherd, F. J.**, Canadian physician, professor of anatomy and dean of the medical faculty, McGill University, Montreal, was born at Cavagnol, province of Quebec, 1851. LL.D., Edinburgh and Harvard. He was demonstrator of anatomy in McGill University, 1875; president of the Montreal medico-surgical society, and vice-president of the international dermatological congress, 1894 and 1907. Author: *American Text-Book*

**Sheridan, Philip Henry**, American general, was born at Albany, N. Y., 1831. He was graduated at West Point in 1853. At the beginning of the civil war he was a captain in the 13th infantry, was made quartermaster of the federal army in Missouri, and rapidly passed up through the various grades to major-general in 1863 for brilliant service.

Grant served in the battles of Perryville and Stone river. For his decisive victory over Early at Cedar Creek—the occasion of his famous ride—he was promoted to major-general in the regular army, and received the thanks of congress. In returning to the north, he was in command of the army of 25,000 men, the most conspicuous under Grant in the operations before Petersburg, and in the final battles preceding Lee's surrender. When Sherman was made general, Sheridan was made lieutenant-general, and when Sherman was retired, a special act of congress conferred the further rank of general upon Sheridan. He died in 1893, and was buried in the army cemetery at West Point.

Sheridan, Richard Brinsley, at Rosherville, Mass., 1888. Sheridan, a brilliant dramatist and politician, was born in Dublin, 1751. He was educated at Harrow, and became a student of the Temple, London, though he was never called to the bar. In 1776 he wrote *The Rivals* successfully at Covent Garden. In 1777 he became part proprietor of Drury Lane theater, for the production of which he wrote *The School for Scandal* and also *The Critic*, one of the wittiest farces in the language. During the whole time of Pitt's administration the talents of Sheridan were displayed in combating the French. He was a brilliant speaker, however, his eloquence was acknowledged, and especially his eloquence on the occasion of the Warren Hastings trial, which was held in 1786, and was buried in Westminster Abbey.

**Sherman, James Schoolcraft**, lawyer, banker, vice-president of the United States since 1909, was born in Utica, N. Y. 1855. He was graduated from Hamilton College in 1878, and was admitted to the bar in 1880; LL.D., Hamilton, 1903. Was mayor of Utica, 1884; chairman of New York state republican convention in 1895 and again in 1900; and chairman of the national republican congressional committee, 1906-09. He was a member of congress, 1887-91, 1893-1903, and 1903-09; elected vice-president of the United States, 1908, taking his seat, March 4, 1909.

**Sherman, John,** American statesman, brother of William Tecumseh, was born at Lancaster, Ohio, 1823. He was employed for a time at surveying and was admitted to the bar in 1846. He entered into partnership with his brother. He became an anti-slavery whig, and as such entered congress in 1850. He was elected to the senate and continued in the house until 1861, when he was elected leader of the republicans. He was then United States senator, 1861-77, and 1881-97; secretary of treasury, 1877-81; secretary of war, 1881-85; and secretary of state under President McKinley, 1897-98. He supported the reconstruction measures, defended the protective tariff, and took a leading part in the introduction of the currency of specie payments and the refunding of the national debt, and was author of the famous Sherman anti-trust law. Died at Washington, 1900.

**Sherman, Roger**, American statesman, was born at Newton, Mass., 1721. He was a shoemaker by trade, then a surveyor of lands, and finally a lawyer and judge; served in both the continental and the United States congresses from 1774 to 1791; was one of the committee that drafted the declaration of independence, one of the signers of it. He was United States senator 1791-93.

**Sheridan, William Tecumseh**, American general, was born in Lancaster, Ohio, 1820. He was graduated at West Point in 1840, and received a commission as first lieutenant in the United States army in 1841. During the war with Mexico he was promoted to the rank of captain. In 1861, he was appointed colonel of infantry. Raised to the rank of brigadier-general. He distinguished himself at the battle of Shiloh, and as major-general in the siege of Vicksburg. Raised to an independent command, he marched across the state



of Mississippi, took command of the army of Georgia, forced General Hood to evacuate Atlanta, and captured Savannah and Charleston, from which point he moved north, and, by cutting off the resources of General Lee, compelled the evacuation of Richmond, and the surrender of General Lee to General Grant, April 9, 1865. He was Northern general acquired popularity as then Sherman. He was appointed lieutenant-general in 1866, and in 1869 became general and commander-in-chief of the army. He was a man of design, fertility of resource, brilliant strategy, and untiring energy. General Grant pronounced him "the greatest general the world had produced." He retired from the command of the army of the United States, 1884. Died, 1901.

**Shorey, Paul**, university professor, was born at Davenport, Ia., 1857; graduated from Harvard, 1879; University of Leipzig, 1882; University of Bonn, 1882; American School of Classical Studies, Athens, 1885-3; Th. D., University of Munich, 1884; L. D., Iowa College, 1895; admitted to bar, Chicago, 1880. Professor of Greek, Bryn Mawr College, 1885-92; professor of Greek since 1892; head department since 1890, University of Chicago. Annual associate director of American School Classical Studies, Athens, 1901-2; president American Philological Association, 1902. Author of *De Platonis Idearum Doctrina; The Idea of Good in Plato's Republic; The Odes and Epodes of Horace; The Unity of Plotinus*, etc.

**Siddons, Sarah**, noted English tragic actress, was born at Brecon, 1755, daughter of Roger Kemble, manager of a company of actors. She married her eighteenth year married William Siddons, an actor, and in 1775 made her first appearance in London as Helen, in *Philoctetes*, at the Theatre Lane, 1782, in the character of Isabella in *The Fatal Marriage*. In 1785 she appeared as Lady Macbeth, her greatest success. She married John Catherine. Thereafter her course was a continual triumph. She died in 1831. In 1783 Sir Joshua Reynolds painted her in *The Fatal Marriage*.

**Sidwick, Henry**, English moralist and economist, was born in Yorkshire, 1838, and educated at Trinity College, Hartford, Conn., 1856. He came from 1859 to 1875, becoming professor of moral and political philosophy in the latter year, and professor of moral philosophy in the former. His chief works comprise *The Methods of Ethics; The Principles of Political Economy; History of Ethics; and The Elements of Political Economy*.

**Sidney, Sir Philip**, English writer and soldier, was born in Kent, 1554. He was educated at Oxford, travelled throughout Europe, and returned to become a favorite at Elizabeth's court. He was called "the jewel of her dominions." For her entertainment he wrote his celebrated *Arcadia*. He served several minor posts in the army. He also has *Apology for Poetries and Defense of Poetries*. He was killed at the battle of Zutphen, 1596.

**Siegel, Henry**, German engineer and electrician, was born at Lüneburg, Germany, 1852. He was educated in Germany, and in 1874 school, Washington. He came to the United States in 1877, and in 1878, at Chicago in 1876, established the clock manufacturing firm of Siegel, Hartfield and Company; later Siegel Brothers, and finally established Siegel, Cooper and Company, department store, Chicago.

**Siemens, Ernst Werner von**, German engineer and electrician, was born at Lenthe in Hanover, 1816. In 1838 he entered the Prussian artillery, and in 1844 took charge of the artillery workshop at Berlin. He developed the telegraphic system in Prussia, and discovered the insulating property of gutta-serena, and was the first to explode a submarine mine by electricity. Besides devising numerous forms of galvanometers and other electrical instruments, he was the inventor of the discoverers of the self-acting dynamo. He determined the electrical resistance of different substances, the Siemens system being called after him. He died at Berlin in 1892.

**Siemens, Sir William (Karl Wilhelm)**, German electrician, was born at Berlin, 1823. He was brother of the preceding. He studied at Göttingen, giving special attention to science. As manager of the house of Siemens Brothers, he was engaged in constructing telegraph lines, the steamship *Parady* being designed by him for cable laying. He invented a water level, a bathometer for measuring ocean depths, an electrical thermometer, and a process of hastening the growth of plants by electric light. He was president of the three principal telegraphic societies of Great Britain, and of the British association, and in 1882 was knighted. He died at London, 1883.

**Siemkiewicz (Siemkiewicz), Henryk**, Polish novelist, was born at Warsaw, 1846, and was educated at the University of Warsaw. In 1876 he came to the United States, and for a time, in company with his wife, he was a countryman, he resided in California, where he designed to establish a Polish colony. He returned to Poland, and in 1881 he wrote *The Tartar Soloway*, following this, a few years later, by his masterly novel, *With Fire and Sword*. To this succeeded *The Two Brothers*, *The White Dove*, and *Children of the Soil*. In 1895 appeared his masterpiece, *Quo Vadis*—a tale of the time of Nero. His later works include *The Knights of*

the Cross, *Maria Curie*, etc. In 1903 he received the Nobel prize for literature.

**Silliman, Benjamin**, American physicist, was born at Trumbull, Conn., 1779. He was educated at Yale College, and admitted to the bar in 1803, but soon after received from the college the appointment of professor of chemistry, and held this position until his death in 1851. He edited the *American Journal of Science*, better known as *Silliman's Journal*, of which he was for twenty years the editor. Died, 1851.

**Sisley (s'p'z'), Emmanuel Joseph**, better known as the Abbe Sisley, French revolutionist, was born at Paris, 1754. He was educated for the church at Paris; during the reign of terror he withdrew into the country; but after Robespierre's fall he returned to Paris, and took an active part in affairs, and became president of the national assembly in 1790. He retired with the title of curé and obtained grant of land and property to the value of at least \$250,000. He was called at the restoration, but returned to Paris during the revolution of 1830, and died there in 1836.

**Sifton, Clifford**, Canadian statesman, was born in Midland county, Ontario, 1836. He was graduated at Victoria University, Coburg, 1860; was admitted to the Manitoba bar, 1862; practiced in Brandon, 1862-6; returned to Victoria, 1866. He was graduated in 1895. He was a member of the Manitoba legislature, 1888-96. He was first elected to the Dominion Parliament in 1896, and re-elected in 1900 and 1907.

**Sigel (s'ig'el), Franz**, American general, was born at Baden, 1817. He was educated at the grand-duke of Baden, and became minister of war in the revolution of 1848, but was obliged to flee to the United States. He was admitted to the federal army as colonel in 1861, during the civil war, and by gallant service rose to the rank of major-general. He died at the register of New York City, 1871-72. Died, 1902.

**Sigmund (s'ig'-mud), emperor of Germany**, was born at Vienna, 1260. He was the son of Frederick II. He led an expedition against the Turks at Nicopolis in 1296. Some years later he conquered Bosnia, Herzegovina, and Serbia. He was emperor of Germany in 1411. Died 1437.

**Simon (s'om'), Jules Francois**, French statesman and politician, was born at Paris, 1814. He was educated at Lorient and at Vannes, and in 1839 became professor of philosophy at the University of Bordeaux. He was a member of the corps législatif, 1863-70; minister of public instruction, 1871-73; senator and member of the French Academy, 1875, and prime minister, 1877. He was a devoted and patriotic republican, but supporting his family by his pen, and preserving an absolutely staid character to the last.

**Simpson, Sir James Young**, noted Scottish physician, was born at Bathgate, Scotland, 1811. He was educated at Edinburgh, and became a doctor in medicine in 1832, and in 1840 was appointed to the chair of obstetrics there. In this he was a pioneer, and made many improvements in the art, and made improvements in the old methods of practice. Died, 1870.

**Simpson, Matthew**, American Methodist Episcopal clergyman and bishop, was born in Cadiz, Ohio, 1811. He was graduated in medicine in 1835, and soon after entered the ministry in the Pittsburgh conference. He was vice-president and professor in Allegheny College, 1837; president of Indiana Asbury University, 1839, and editor of the *Western Christian Advocate*, 1848. He was the author of *A Hundred Years of Methodism*, and of the *Catechism of Methodism*, and was one of the most eminent pulpit orators of the nineteenth century. Died, 1884.

**Slack, John**, author, was born in Baltimore, 1878, and graduated from the College of the City of New York, 1897. He assisted the government in the investigation of the anarchist movement, and has taken a leading part in socialist movements. Author: *Springtime and Harvest; Peace Haven*, a novel; and *Unconquered America; The Industrial Republic; The German*, etc.

**Slarlar, William Macdonald**, English prelate, archbishop of London and dean of St. Paul's, since 1889, was born at Leeds, 1850. He was graduated at Balliol College, Oxford, and became assistant minister of Chelsea chapel, 1876. He was resident chaplain to the bishop of London, 1877; chaplain to the order of St. John of Jerusalem, 1900, and chaplain-in-ordinary to the queen. Author: *The Servant of Christ; Simplicity in Christ*, etc.

**Slavich, Jean Charles Leonard**, distinguished Swiss historian of Italian descent, was born at Geneva, 1773. Before he was twenty he had written his first work, the reverse of his father made it necessary for him to enter a counting-house. In 1803 appeared his first political work, *History of the Swiss Republic*. In 1813 appeared his *Literature of Southern Europe*, and in 1819 he became minister of education, a post with which he was occupied until his death, in 1842.

**Slav IV. Pope, Francesco della Rovere**, was born in a small village near Savona, Italy, 1414. He had a great reputation as a preacher throughout Italy, and became pope in 1471. Learning

and especially the improvement of the city, grew much to him. He built the Sistine chapel and the Sistine bridge across the Tiber, increased the Vatican library, and patronized the great painters of his time. He died in 1484.

**Silvius V. Felice Peretti**, one of the abbot of the pope, was born near Montalto, Italy, 1521. He was in Rome in 1570, and became cardinal, an eloquent preacher, vicar-general, and cardinal, and succeeded Gregory XIII. His pontificate was short, as there was any scholar of his time. He also died the number of cardinals at seventy. Died, 1590.

**Silvestre, Walter William**, English philologist, was born in London, 1835. He was graduated from Christ's College, Cambridge, 1858, became B.A. in 1860, and in 1870 received the D.D. from Balliol College, Oxford. He was the first director of the diocesan society, established in 1873, and contributed to more than any scholar of his time to a sound knowledge of Middle English and English philology generally. His works include: *Piers Plowman; Chaucer's Brute; Chaucer's Treatise on the Astrology*, etc.; editions of Chaucer's *Forma; Chaucer's Minor Poems*; and *Principles of English Etymology*, his great edition of Chaucer, in 6 volumes etc.

**Sobieski, Jan**, Russian general, was born in 1844. He fought against the Polish insurgents in 1863, and in 1871 he was promoted to the rank of general. In 1881 he stormed the Turkish stronghold Gök-Tep. He died near Moscow, in 1882. He was a member of the Russian Academy.

**Silver, Thomas Roberts**, Unitarian clergyman, was born at Washington, 1847. He was educated in England, and in 1870 he came to Harvard. He was a Methodist Episcopal minister ten years in Maryland, Colorado and New York. He was a member of the American Unitarian pastors in Providence, R. I., and Buffalo, N. Y.; and since 1897 has been pastor of the Unitarian church in New York City.

**Silwell (sil'-el), John**, American lawyer and politician, was born in New York city about 1793. He was educated at the University of the State Senate; and in the civil war, when Louisiana seceded, he withdrew, and was appointed colonel of the 12th Maine. He was afterwards with James M. Mason, who was named minister to England, he was taken on the high seas by Captain Wilkes, of the United States frigate, and was brought to the United States, where they were confined in Fort Warren. On the demand of England, the vessel was released, but the prisoners were kept in custody. After the war closed, he settled in England and resided there until his death in 1871.

**Sisson, John**, American historian, both Low professor of history, Columbia, since 1898, was born at Richmond, Va., 1824. He was graduated at Richmond, 1846; Ph.D., Leipzig, 1876; L.L.D., Columbia; professor at Princeton University, 1876-96; and editor *Princeton Review*, 1880-96. Author: *The French Revolution and Napoleon Bonaparte; A History, 4 volumes; French Revolution and Napoleon Bonaparte*, etc.

**Slocum, Henry W.**, American general, was born, 1827, at Delphi, N. Y. He graduated from West Point in 1852. On the outbreak of the civil war, he was commissioned colonel of the 27th New York volunteers and took part in the first battle of Bull Run, where he was wounded. In August he was made brigadier-general. He distinguished himself at the battles of Gaines' Mill, Gettysburg, and Appomattox. He was promoted to major-general of volunteers. Later he was transferred with his corps to the army of the Cumberland, and fought at the battle of Stones River, and was the first to enter Atlanta. In Sherman's march to the sea and through the Carolinas he was a member of the staff, and took a leading part of that campaign. After the war he took up the practice of law at Brooklyn, was elected to congress in 1868, and died in 1884. He died at Brooklyn, N. Y., 1884.

**Smeaton, John**, English civil engineer, was born near Leeds, England, 1724. He began his career as a maker of mathematical instruments, but continued his studies and experiments, inventing, in 1751, a machine for measuring the depth of the sea. He was also the builder of the famous Eddystone light-house. He died, 1792.

**Smith, Samuel**, Scotch physician, was born at Haddington, Scotland, 1812. He was graduated in medicine at Edinburgh, at twenty, and practiced as a physician in 1834. He began his career as a maker of mathematical instruments, but continued his studies and experiments, inventing, in 1751, a machine for measuring the depth of the sea. He was also the builder of the famous Eddystone light-house. He died, 1792.

**Smith, Adam**, Scotch political economist, founder of the Scotch school of political economy, was born at Kirkcaldy, in Fifeshire, 1723. In 1764 he accompanied the duke of Buccleuch to the continent, and in 1766 he was elected to the company which he engaged for two years; but at the end of that time he returned to Kirkcaldy. He was a member of the Scotch Academy, and a member of customs in 1778, when he took up his residence in Edinburgh. In 1776 he produced his great work, *An Inquiry into the Nature and*







In Italy he gathered the materials for her novel of 1858, and in Germany he gathered the materials for his celebrated work entitled *Der Allemagne*, a description of the habits, literature, and political condition of the country. His first novel, *Le Ten Years Year of Berlin*, an impassioned denunciation of Bonaparte and his arbitrary rule. After the 1848 revolution the publisher of the book was again interfered in politics. She died in 1817.

**Stanford, Wendell Phillips**, American jurist and poet, was born at New Bedford, Mass., 1803; graduated at St. Johnsbury Academy, 1880; graduated from the law department of Boston University, 1880. He studied law at New York, Vermont, 1900-04; associate justice of the supreme court of the District of Columbia, since 1904; and professor of equity jurisprudence in the George Washington University. Author: *Neris Flores*, poems; and a contributor of poems and articles to magazines.

**Stahl (Athal)**, **Georg Ernst**, German physician and chemist, was born at Anspach, 1660. He wrote a system of medicine *Theoria Medica vera*. His system of therapeutics corresponded with his pathological principles, and was confined mostly to bloodletting and the use of laxatives. Died in Berlin, 1734.

**Standish, Miles**, early New England colonist, was born at Lancaster, England, about 1607; served in the army in the Netherlands and sailed with the pilgrims in the *Mayflower* in 1620. On returning Massachusetts he was elected captain by the pilgrims, and commanded in expeditions against the savages. Died, 1655.

**Standish, Leland**, American capitalist and philanthropist, was born at Watertown, N. Y., 1824. He was one of the organizers of the Central Pacific Railroad company, and entering political life was republican governor of California, 1861-63; and from 1863 to 1893 United States senator from California. One of the largest landowners in the property to the value of \$20,000,000 to found, in memory of a deceased son, a University at Palo Alto to be known as the Leland Stanford Junior University. He died at Palo Alto, California, 1893.

**Stanley, Arthur Penrhyn**, English scholar and divine, was born at Alderley, England, 1815. He graduated at Oxford. From 1856 to 1883 he was professor of ecclesiastical history in the University of Christ church, and chaplain to the bishop of London. In 1864 he succeeded Archbishop Sumner as dean of Westminister. He was one of the most accomplished and liberal theologians of his age, and may be regarded as the founder of the "broad church" party. His chief writings are: *The Unity of Biblical and Apostolic Teaching*; *Lectures on the Eastern Church*; *Discourses on the Unity of the Church*; *Discourses of Westminster Abbey*, etc. Died, 1881.

**Stanley, Sir Henry Morton**, African explorer, was born at Wexham, England, 1841. He reached Zanzibar early in 1871; there organized a large expedition, and found Livingstone, November 10, 1871. In 1874 he set out on a second African expedition for the *Herald* and *London Daily Telegraph*. He reached Victoria Nyamira in February, 1875; was the first to circumnavigate Victoria lake, and discovered the Shirewye river; and reached England again in February, 1878. Near the close of 1880 Stanley, under the auspices of the Egyptian government and of English scientists and industries, undertook an expedition for the relief of Emin Pasha. He wrote *How I Found Livingstone*; *Through the Dark Continent*; *Explorations and Discoveries in East Africa*; *Darkness Africa*. He was made a D. C. L. by Oxford University in 1900. He was a member of the Parliament, 1890-1900, and was knighted, 1899. He died, 1904.

**Stanton, Edwin McMaisters**, American statesman, was born at New York, 1801. He practiced law with success in his native town until 1847, when he settled in Pittsburgh, Pa. There he became known as a statesman. He took up his abode in Washington, in 1860 was appointed general of the United States, and in 1862, secretary of the treasury. He was President Johnson, who appointed General Grant in his place at interim. In May he definitely returned from the secretaryship. In December, 1869, he was appointed an associate justice of the supreme court of the United States, and died the same month.

**Stanton, Elizabeth Cady**, reformer and suffragist, was born at Johnstown, N. Y., 1815. She signed a petition for the first woman's rights convention at Seneca Falls, 1848, and became president of the national woman's suffrage association there formed. During the civil war she labored in the north. A *History of Woman Suffrage*. Died, 1902.

**Stark, John**, American soldier, was born at Londonberry, N. H., 1728. At Bunker Hill he was colonel of a regiment which he had collected. On August 16, 1777, he fought the battle of Bennington, which brought him the thanks of congress and the rank of general; he cut off Burgoyne's retreat from Saratoga, and after serving in Rhode Island and New Jersey, had charge of the southern department, with headquarters at Saratoga. He died, 1822.

**Starr, Frederick**, anthropologist, was born at New York, 1858; graduated at Lafayette College, 1882; Ph. D., 1883; Sc. D., 1907; professor of biological sciences, Case College, 1884-85; in University of California, 1885-86; in University of Illinois, 1886-91; assistant professor anthropology, 1892-5, associate professor since 1895 and curator of the Peabody Museum, 1895-1907. He was at the University of Chicago. Has done extensive anthropological work in Japan, Africa, Mexico, and other parts of the world. His chief works are: *The First Steps in Human Progress*; *American Indians*; *Stations of Southern Mexico*; *Strange Peoples*; *Modern Man*; *Modern Man*; *The Truth About the Congo*; *In Indian Mexico*, etc.

**Stead, William Thomas**, English journalist and editor, was born at Wakefield, 1837. He was editor of the *Northern Echo* at Darlington, 1871-80; assistant editor of the *Pail Mail Gazette* since 1889, and editor from 1883 to 1889. In 1890 he founded the English Review of *Reviews*, of which he is the present editor. Author: *Heart of Man*; *Queen's Son's Favorite World*; *A Study of Despairing Democracy*; *The Conference at The Hague*; *The Americanization of the World*.

**Stedman, Edmund Clarence**, American poet and critic, was born in Hartford, Conn., in 1833. He graduated at Yale, 1855. He was editor of the *Norwich Tribune*, 1852-53; *Wanted Herald*, 1854-55; on the *Register*, 1855-56; and the *New York Times*, 1861-63; and was a member of the New York stock exchange, 1863-64. Author: *Four Years of the Indian*; *The Nature and Elements of Poetry*, etc. Editor: *A Victorian Anthology*; *An American Anthology*. His *History of the United States*, Dublin, etc., died in New York in 1908.

**Steele, Sir Richard**, British man of letters, was born in London, 1672. He was educated at the Charterhouse with Addison, and at Oxford. In 1709 he founded *Tatler*, a periodical published three times a week, succeeded by *Steele's Journal*, a literary journal of a higher tone and character, and was elected to parliament as member for the county of Lincoln, 1713. He died, 1729.

**Stein (died)**, **Jean**, celebrated Dutch painter, was born at Amsterdam, 1648. He had three sons, Jan, Van Goyen, whose daughter Margaret he married. He died, 1679.

**Stein, Heinrich Friedrich Carl, Baron von**, Prussian statesman, was born at Nassau, 1757. As superintendent of the Prussian estate he was the last holder of office of royal power, with the privileges of caste, erected peasant proprietors, extirpated monopolies and hindrances to commerce, and during his tenure of office Napoleon insisted upon his dismissal, and Stein withdrew, 1808, to Austria, but not before issuing the famous edicts of 1808. From 1813 to 1815 he was at the congress of Vienna he was the principal spirit of the opposition to the emperor.

**Steinmetz (alias'arte)**, **Charles Proteus**, electrician, General electric company, was born in Brooklyn, N. Y., 1835. He was educated at Zurich, and in Switzerland. He is the consulting engineer for the General electric company, and a leading authority in mathematics and engineering.

**Steinwaghen, Henry Wrightman**, American physician, was born at Philadelphia, 1833. He graduated at Andalusia College, Pennsylvania, 1857; was then dermatologist to Philadelphia hospital since 1888, to Northern dispensary since 1892. Howard hospital since 1893. Author: *Essentials of Diseases of the Skin*; *Treatise on Diseases of the Skin*. Died, 1900.

**Stephen, Sir James Fitzgibbon**, British jurist, was born at Kensington, England, 1829. He graduated at Trinity College, Hartford, Conn., 1850; was admitted to the bar in 1854; professor of common law at the Inns of Court, 1857-79; and judge of the High Court, 1879. He was knighted, 1880. A monument he was erected a baronet. He died near Ipswich, 1891.

**Stephen, Sir Leslie**, English man of letters, was born at Kensington, 1832. He was educated at Eton, King's College, London, and at Trinity Hall, Cambridge, where he was fellow and tutor. He was editor of the *Cornhill Magazine*, 1871-82, and of the first twenty-six volumes of the *Dictionary of National Biography*, 1882-92. He was editor of the *English Thought in the Eighteenth Century*; *Johnson*; *Pope*; *Swift*; *The Science of Language*; *Four Studies of a Biographer*. He died in 1901.

**Stephens, Alexander Hamilton**, American statesman, was born in Georgia, 1812. He graduated at the University of Georgia, 1832. In 1850 he opposed the secession of his state, but in the following year he elected vice-president of the Confederate States of America. After the collapse of the latter, Stephens suffered a brief imprisonment at Fort Warren, and in 1865 after being reflected United States senator, was not allowed to take his seat. He was, however, member of the house of representatives, 1867-82, and governor of Georgia, 1882-83. In 1869 he published *A History of the War of Secession*.

**Stephens, Henry Morse**, British historical writer and educator, was born at Edinburgh, Scotland,

1837. He graduated at Balliol College, Oxford, 1859; M. A., 1860. Lecturer on Indian History, Cambridge, England, 1862-64; and professor of history and director of University extension at University of California, since 1892. Author: *History of the French Revolution*; *Albuquerque*; *Revolutionary Europe*; *Colonial City Service*, etc.

**Stephenson, George**, the founder of the railway system of Great Britain, and perfecter of the locomotive engine, was born in Northumbria, 1781. At the age of 14, he joined his father as a journeyman, and in 1802, where, by a close attention to all he saw, and a constant study of every piece of mechanism that came in his way, he acquired a large amount of sound practical knowledge; while by meeting best workmen, and seeing the best clocks, he was enabled to add a trifle to his weekly earnings.

In 1812 he was appointed engineer to the colliery, at a salary of \$500 a year. Soon after this he built his first traveling engine to draw the wagons along the tramway, which, though clumsy and weak in power, was immensely superior to any engine in use at the time. The following year he constructed one superior to his first as that had been to all others before it.

From this time improvement followed on improvement, and rapid success followed. Not only in the form of the locomotive, but in the rails and in every department to which steam was applicable, till, from mere tramways, the whole beneficent system of railway locomotion, with all its complications of stations, signals, tenders, and carriages, was at last completed by the opening of the Liverpool and Manchester railway.

In 1830 this great undertaking was opened, and from that time the name of Stephenson became one of the most popular among men of science in Europe. In 1845 he retired from all railway work, and devoted his time to his collieries and other sources of business, and, after having been instrumental in establishing all the foreign and home lines, he died in 1848, leaving his fortune and his fame as a statesman, and his reputation as a statesman.

**Stephenson, Isaac**, United States senator, was born near Fredericton, New Brunswick, 1829. In 1858 he moved to Marinette, where he had an active career in business. He was elected to the United States senate, 1907, to fill the unexpired term of Hon. J. C. Spooner, and was re-elected in 1909.

**Stepniak (stepniak)**, pseudonym of Sergius Michailowitsch Kravtchinski, Russian revolutionary leader and writer, born, 1841. Among his works were: *Underground Russia*; *Russia under the Tsar*; *Wladimir as it is*; *King Street and King Log*. He was run over by a train in a London suburb, and killed, 1895.

**Sternberg, George Miller**, American physician, surgeon-general of the United States, 1893-1902, was born at Hartford seminary, Utica county, N. Y., 1838. He graduated at the College of Physicians and Surgeons, New York, 1861; L. D., Michigan, 1864; and is a member of many medical societies and president, 1898, of the American Medical Association. Author: *Micrographia*, and *How to Make Them*; *Bacteria*; and many government reports, etc.

**Steuart, John**, English statesman, was born at Clonmel, Ireland, 1715. He studied at Cambridge and became a clergyman. In 1759 he wrote the first two volumes of *Life and Opinions of Tristram Shandy*. The rest of the work, which reached nine volumes, as written at the request of the author, was published in France and Italy, published in 1768, was the result of a tour through those countries in 1765. He died at London, 1768.

**Steuart, William Mott**, statistician, was born at Corpus Christi, Texas, 1861; graduated, L. L. B., Columbia, 1884; and was admitted to the bar, 1884, L. L. M., 1888. Admitted to bar, 1884; practiced in D. C., Md., and Detroit; became connected with the Bureau of Census, 1890; chief of division, 1890 and 1900, chief statistician for manufactures, since 1903, Bureau of Census. Supervised the canvass and preparation of reports of various censuses.

**Steuben, Frederic William Augustus, Baron**, Prussian general, was born at Magdeburg, Prussia, 1730. He came to America in 1778 and offered his services to Washington, who placed, as assistant, during the dark days of Valley Forge. He was appointed inspector-general; remodelled the army; took part in the battle of Yorktown, and was given the rank of \$2,400 yearly and a township of land near Ulster, N. Y., where he died, 1794.



which *Frau Sappho*, *Der Katakomben*, and *Es War* are the most impressive. The drama *Sedop's Ende* was produced in 1880, and was followed by *Die Hölle* in 1882. In 1886 he produced in Berlin and Rosenau at Vienna in 1907, *Die Hölle* (ed.), *Marie-Joseph Enghien*, French novelist, was born in Paris, 1804. In 1850 he was elected to the legislative assembly, as one of the deputies for the department of Seine. His writings extend over many volumes. His reputation as a writer rests mainly on *The Wandering Jew* and *The Mysteries of Paris*. He died in Savoy, in exile

**Sulla, Lucius Cornelius**, Roman general and dictator, was born, 138 B. C. After holding the dictatorship for about two years, he resigned his office in 79 B. C., and retired to an estate he possessed at Puteoli, where he died in the following

**Sullivan, Sir Arthur Seymour**, English composer was born in London, 1842. He studied in London and at Leipzig, and in 1862 composed incidental music for *The Pirates of Penzance*; *Pansey*; *Patience*; *The Mikado*; *The Gondoliers*; *The Yeomen of the Guard*; *The Gondoliers*, etc. He has also written cantatas, overtures, oratorios, church music, and ballads. He became a member of the legion of honor, 1878, and was knighted in 1883. Died, 1900.

**Bully, James**, English educator and philosophical writer, late Grote professor of philosophy of mind and logic, University College, London, was born at Bridgewater, 1842. Author: *Sensation and Intuition; Positivism; Illusions; Outlines of Psychology; Children's Ways; An Essay on Laughter*, etc.

**Sully, Maximilien de Bethune, Duke of, French** soldier and statesman, noted minister of Henry IV., of France, was born at Rosny, near Nantes 1560. In 1601 he was sent on a confidential mission to Queen Elizabeth of England. He was created duke of Sully in 1606, and was made marshal of France in 1634. He died at Villebon near Charters, 1641.

**Sully, Thomas**, American painter, was born in Lincolnshire, England, in 1783. As a portrait painter, he enjoyed great reputation. Jefferson, Lafayette, Madison, Jackson, and many other of the most illustrious personages of the time being among his sitters. Died, 1872.

**Sumner, Charles**, American statesman, was born at Boston, 1811; was graduated at Harvard University, 1834; in 1851 he entered the United States senate as the successor of Daniel Webster, retaining his seat until his death. In the debate on the repeal of the Missouri compromise, Sumner took the position in Kansas he took a prominent part. His speech upon this issue, delivered in 1856, under the title "The American Question," was one of the ablest of members of congress from South Carolina, one of whom, Preston S. Brooks, on May 22d assaulted Sumner, and he had to be removed from the chamber. In 1871 he opposed the annexation of San Domingo to the United States. He published *White Slavery in the United States, Origins and Speeches*, etc., 1875. He died at Washington, D. C., 1876.

**Sumner, William Graham**, American educator and economist, professor of political and social science at Yale 1872-1910, was born at Paterson, N. J., Jan. 1840. He graduated at Yale, 1863; LL. D. 1880. Author: *A History of American Currency*; *Robert Morris; The Financier and Finances of the Revolution*; *Folkways*, etc. Died, 1910.

**Sutherland, George**, lawyer, United States senator, was born in Buckinghamshire, England, 1862. He attended the law department of the University of

**Suturoff** (sû-rô'ôf), **Prince Alexei**, celebrated Russian field marshal, was born in 1729, at Suskoi, in Finland. In the war against the Turks from

In 1787 to 1790, he gained the battle of Rymnik, took Isevil by storm, and obtained other important advantages. When Russia joined the continental coalition, in 1799, he was placed at the head of the combined army in Italy, and, after several sanguinary battles, succeeded in wresting that country from the French. He died, 1800.

**Swain, Joseph**, American educator, president of Swarthmore College since 1902, was born at Pendleton, Ind., 1857. He graduated at Indiana University, 1883; A. M., M. L. D.; professor of mathematics in Leland Stanford Jr. University, 1891-93; and president of Indiana University, 1893-1902. He is a member of the national council of education, national council of religious education, etc.

**Sweetman, Arthur**, archbishop of Toronto, and primate of Canada since 1907; was born in 1834. He was graduated at Christ's College, Cambridge; rector of Grace church, Brantford, Ontario, 1872-76; secretary of the diocesan synod, 1872-79; secretary to Canadian house of bishops, 1873-79; archdeacon of Brant and rector of Woodstock, Ontario, 1876-79; and bishop of Toronto, 1897-1907.

**Swedenborg** (swi'den-borg), Emanuel, Swedish philosopher and mystic, the founder of the New church, was born in 1688, at Stockholm. In 1743 he claimed a divine commission to disclose the internal or spiritual sense of scripture by the

correspondence existing between natural and spiritual things, and thereby to make known its true doctrines. He also stated that for the purpose of his mission he was intermitted as to his soul into heaven, hell, and the intermediate state between them. Of these he treats in *Heaven and Its Wonders*, *The Last Judgment*, and *The Earth is the Universe*. In his philosophy, which is really one with his theology, he treats of creation in his *Divine Love and Wisdom*. He died in London 1772.

**Sweet, Henry**, English philologist, was born in London, 1845. He studied at King's College, London; at Heidelberg, and at Balliol College, Oxford; M. A., Ph. D., LL. D. Author and editor of editions of Old and Middle English texts; Old and Middle English readers and primers; *Student's Dictionary of Anglo-Saxon*; *Primer of Spoken English*; *History of English Sounds*; *Primer of Phonetics*; *The Practical Study of Languages*.

Swift, Jonathan, British satirist, was born in Dublin, of English parents, 1667. He was educated at Trinity College, Dublin, and then moved to London. He became a member of the household of Sir William Temple. Before 1700 he had written the most powerful satirical work of the eighteenth century, the *Tale of a Tub*, in 1704 he wrote the *Discourse of the Dissolution of the Convent of the Abbess*, and innumerable pamphlets and quackeries against the whigs, and became a formidable force in the Tory party. His political views were so strong that he compelled the government to abandon a scheme for supplying Ireland with copper coinage. The triumphant author made his last visit to England in 1745, and died in 1745. He was one of the most popular of all his works. Died, 1745.

**Swinburne, Algernon Charles**, English poet and prose writer, was born in London, 1837. He was educated at Balliol College, Oxford. His first productions were the plays, *Queen Mother* and *Rosalind*, and these were followed by two tragedies, *Attila* and *Endymion*, and the poem *Italy*; by the dramas *William Blake*; and *Songs before Sunrise*. His subsequent works include: *Bathurst*, a Tragedy; *Songs of Two Nations*; *Century of Roundels*; *A Study of Victor Hugo*; *Studies in Prose and Poetry*; *The Duke of Gardia*, etc. He died in 1909.

**Hybel** (at/bel) **Heinrich von**, German historian born at Dönnelsdorf, 1817. He studied at Berlin under Raake; became professor of history at Bonn, 1844; and in 1875 was made director of the state archives at Berlin. Then came his great work, *Geschichte der Revolutionszeit, 1789-95*, a history of the French revolution based upon official documentary evidence. He died at Marburg, 1895.

**Sydenham** (sid'en-am). **Thomas**, English physician was born at Wioford Eagle in Dorsetshire, 1624. His last work, *Processus Integri*, in 1692, is an outline of pathology and therapeutics. Seemingly behind his age in science, he was really ahead of it in practice. He died at London, 1689.

**Symonds (si'monds), John Addington**, an Englishman of letters, was born at Bristol, England, 1840. He was graduated at Oxford. His chief writings are an *Introduction to the Study of Daniel*; *Studies of the Greek Poets*; *Sketches in Italy and Greece*; *The Renaissance in Italy*; *Italian Byways*; *Shakespeare's Predecessors in the English Drama*. *The Renaissance in Italy* is his chief work. He died at Rome, 1893.

**Tacitus** (*luc' -tus*), **Gaius Cornelius**, Roman historian and orator, was born about 55 A. D. In 97 he was appointed consul, succeeding T. Virginii Rufus. Tacitus became one of the most intimate friends of the younger Pliny, of whose letters eleven are addressed to him. The time of his death is unknown, but he probably survived Trajan, who died in 117. His chief works are the *Life of Agricola*, and the *Germania*, both written about 98.

**Tadema, Alma.** See **Alma-Tadema.**

**Wm. William Howard**, twenty-seventh president of the United States, was born in Cincinnati, Ohio, 1823; he graduated from the University of Ohio and from the law school, Cincinnati College, 1850; L. L. D.; admitted to the Ohio bar, 1850; assistant prosecuting attorney, Hamilton county, Ohio, 1851-52; collector of internal revenue, first district, Ohio, 1852-53; was assistant county solicitor, Hamilton county, Ohio, 1853-57; judge of the superior court of Ohio, 1857-60; United States circuit judge, sixth circuit, 1862-1900; president of the United States Philippine commission, 1901; first civil governor of the Philippine islands, 1901-02; secretary of war, United States, 1904-08. He died at Washington, D. C., 1909. He was married to Miss Mary Ann, daughter of John C. Calhoun, United States senator, and succeeded March 4, 1893.

**Taine, Hippolyte Adolphe**, French historian and critic, was born at Vouziers, France, 1828. One of his first essays was crowned by the French Academy. Among his most important works is his *History of English Literature*, a clear and valuable criticism written in brilliant style; in 1878 he was elected to membership in the French Academy. He died at Paris, 1893.

**Tait, Peter Guthrie**, British mathematician and physicist, was born in 1831. He was educated at Edinburgh University, and St. Peter's College, Cambridge; was elected professor of natural philosophy at Edinburgh, 1860. He resigned his chair early in 1901, and died the same year.

**Takahara** (*ta'-da-ah'-ra*). **Kogoro**, Japanese diplomat; born 1874; acting consul, 1894. He was educated in Tokyo and entered the foreign office as student attaché, 1896; acting consul-general, 1898-99; consul-general at New York, 1892; envoy extraordinary and minister plenipotentiary to Italy, 1894-95 and 1906-07, to Austria and Switzerland, 1896-99; and envoy extraordinary and minister plenipotentiary to the United States, 1900-06.

**Takheyran-Firak** (*ta'-he'-ran'-fir'-ak*). **Chah**

les Maurice, Prince de, was born in Paris, 1754. As bishop of Autun he was a member of the states-general which was convoked in 1789. The progress of the revolution led to his retirement to England and afterward to America; but on the fall of Robespierre he returned to Paris, and, thus, to the influence of the Girondins. With Barras, he was appointed foreign minister. In return for his services he was made grand chamberlain, and prince of Bénéveto. After the fall of Napoleon, he became for a time prime minister under Louis XVIII., but ceased to hold this position subsequent to the battle of Waterloo.

**1. Thomas De Witt**, American Presbyterian minister and orator, was born in New Jersey, 1832. He was educated at New York University. He edited for several years *The Christian at Work*, and later the *Christian Herald*, and wrote extensively. In 1889-90 he visited the holy land, and in 1894 made a tour of the world. He was pastor of the First Presbyterian church, Washington, D. C., 1895-99. Author: *Crumbs Swept Up; Marriage Ring*, etc. Died, 1902.

**Tamerlane, or Timur** (*14-m60r*), oriental conqueror, was born at Sebs, near Samarkand, about 1336. His whole career was one of conquest, though he was frequently interrupted by revolts in his own dominions, and in the provinces he had brought under his rule. He was preparing for the conquest of China, but died on his march to that country, 1405.

Taney (16'51), Roger Brooke, American jurist, was born in Calvert county, Md. 1777. He was graduated at Dickinson College; he succeeded John Marshall as chief-justice of the United States supreme court in 1836. His most famous decision was that in the Dred Scott case, in 1857. He died at Washington, D. C., 1864.

**Tarbell, Ida Minerva**, American author and editor, was born in Erie county, Pa., 1857. She was graduated from Allegheny College; editor on staff, and associate editor of *McClure's Magazine*, 1894-1906, and associate editor of the *American Magazine* since 1906. Author: *Early Life of Abraham Lincoln*, with J. McCan Davis; *History*

**Tarkington, Newton Booth**, American novelist, was born in Indianapolis, Ind., 1869. He was graduated at Princeton, 1893; A. M., 1899. Author: *The Gentleman From Indiana*; *Monsieur Beaucaire*; *The Two Vandrrels*; *The Conquest of Canada*; *His Own People*, etc.

**Tarr, Ralph Stockman**, American educator, was born at Gloucester, Mass., 1864. He was graduated at Lawrence scientific school, Harvard, 1891; assistant professor of geology at Harvard, 1892-97; professor of physical geography, since 1906, Cornell University. Author: *Economic Geology of United States; Elementary Physical*

**Taschereau** (*tash'té'*), **Sir Henri Eliezer**, Canadian jurist, chief-justice of the supreme court of Canada, 1902-06, was born in 1838. He was admitted to the Quebec bar, 1857; was appointed a judge of the Quebec superior court, 1871; judge of the supreme court of Canada, 1878.

**Tasso (dà'ssò), Torquato**, Italian poet, was born in Sorrento, 1544. In 1565 he entered the service of cardinal Luigi d'Este, and was invited to the court of his brother, Alfonso, duke of Ferrara. While there he wrote his pastoral

drama, *Aminta*, and in 1575 finished his great epic, *Jerusalem Delivered*, describing the first crusade. In 1594 Pope Clement VIII. summoned him to Rome to receive a laurel crown, but he died soon after his arrival, in 1596.

**Tauler** (*tou'ler*), **Johann**, German mystic, was born at Strassburg, about 1300. He entered the Dominican order about 1318. He died at Strassburg in 1361.

**Taylor, Charles H.**, American journalist, editor and manager of the *Boston Daily Globe* since 1873, was born in Boston, Mass., 1846; member of the Massachusetts legislature, 1872. He served during the civil war to the 38th Massachusetts regiment; was wounded at Fort Hudson, La., 1863; and brigadier-general on Governor Russell's staff, 1891-93. He has long held a prominent

**Taylor, Hannis**, American lawyer, diplomat, was born in New Bern, N. C., 1851. He was educated at the University of North Carolina; LL. D.; professor of constitutional and international law, George Washington University, 1892-98, and was special counsel for the government of the United States before the Spanish treaty claims commission, and before the Alaskan boundary

**Taylor, James Bayard**, American author and traveler, was born at Kennett Square, Pa., 1825. In 1862-63 he was connected with the embassy at St. Petersburg, and in 1874 he was in Iceland.



*Literature* was published in 1840, and at once took high rank, and was translated into Spanish, German, and French. He was one of the founders of the Boston public library.

**Tiffany, Charles Louis**, American merchant, was born at Killingly, Conn., 1812. In 1832 he established a station and fancy goods store next door to A. T. Stewart's establishment. In 1847 Tiffany began the manufacture of gold jewelry. In 1850 Tiffany and James Watson, the diamonds in London, selling them in the United States at tremendous profit. The firm became wealthy and conspicuous. In 1851, Tiffany established branches in several European centers. Died, 1902.

**Tiffany, Louis Comfort**, American artist, was born in New York, 1848. He studied art under George Inness and Samuel Coleman, New York, and John Bailey, Paris, and became distinguished chiefly to oriental scenes in oil and water colors. He discovered the formulas for staining decorative glass known as "Tiffany Favrile glass."

**Tilden, Samuel Jones**, American statesman, was born at New Lebanon, N. Y., 1814. He was educated at Yale and at New York University, and admitted to the bar in 1841. By 1868 he had become leader of the democrats in the state and attacked and destroyed the "Tweed Ring." He died in 1886, leaving a great part of his large fortune to found the Tilden Foundation.

**Tilman, Benjamin Ryan**, United States senator, farmer, was born in Edgemoor county, S. C., 1847. He was elected governor of South Carolina in 1890 and 1892, and has been United States senator since 1898. He is also author of the dispensary act of 1906, selling liquor under state license. One of the leaders in securing the insertion of advanced positions in democratic platform of 1896.

**Till, Johann Torkelin**, Count of, Belgian general, one of the great leaders of the Thirty Years' war, was born near Gembloux, Belgium, 1559. He distinguished the Bavarian army, and was devoted to the Catholic cause, was given command of the Catholic army at the outbreak of the Thirty Years' war. Till was mortally wounded, in the battle of Lech, 1632.

**Tintoretto (tin'-to-ri-oh)**, Venetian historical painter, was born in 1518. His real name was Jacopo Robusti. He rose to the reputation which was employed by the Venetian government to paint a picture of the victory gained over the Turks in 1571. Most of his pictures are in the church at Venice. He died at Venice, 1594.

**Tischendorf, August Friedrich**, Friedrich Konstantin von, German biblical scholar, was born at Lengenfeld in Saxony, 1815. His labors in the use of the best and most accurate methods of the new testament, especially those in 1844, 1853, and 1859, resulted in the discovery of the fourth Greek Sinaitic codex at the altar of the church of Sinai; count of the Russian empire, L. L. D., C. C., etc. He died in Leipzig, 1874.

**Tissot, J. H. (J. H. Tissot)**, French genre painter, was born at Nantou, France, 1836. He was educated at the Ecole des Beaux Arts in Paris, and under Lamotte in Rome. He made his first appearance in the Paris salon in 1859, with a number of fine water colors. He then turned his attention to his series of religious subjects illustrating the *Life of Christ*. Died, 1902.

**Titchener (tik'-en-er)**, Edward Bradford, American educator, professor of psychology at Cornell since 1896, was born at Chester, England, 1867. He was graduated at Branscomb College, Oxford, 1890; Ph. D., D. D., etc.; assistant professor of psychology, Cornell, 1892-95; American editor of *Mind*; associate editor of *American Journal of Psychology*, etc. He is author of *Principles of Psychology*; *A Primer of Psychology*.

**Titian (ti-tan'-oh)**, or **Tiziano Vecellio (ti-sa-no-vec'-el-lyo)**, Venetian painter, was born at Pieve de Cadore, in the Carnic Alps, in 1477. He studied under Giovanni Bellini of Venice, and in 1507 was associated with the master Giorgione in executing certain frescoes.

In 1511 he was invited to Padua, where he executed three remarkable frescoes still to be seen. In 1513 he was commissioned to the unfinished picture of Giovanni Bellini in the Sala del Gran Consiglio at Venice, and the senate were so pleased that they gave him an important office. To this period are attributed his pictures of *The Tribute Money* and *Sacred and Profane Love*.

In 1514 he painted a portrait of Ariosto at Ferrara, and after his return to Venice, in 1518, he painted an *Assumption of the Virgin*, considered one of the finest pictures in the world. About 1528 he produced his magnificent picture, *The Death of St. Peter Martyr*. His picture, says Ariosto, "is so perfect that the great masters admitted they could not find a fault," unfortunately destroyed by fire in 1667.

In 1530 the Emperor Charles V. invited

him to Bologna to paint his portrait and execute various other commissions. In 1532 he again painted the emperor's portrait, and he is said to have accompanied Charles to Mexico, where he received several honors. He remained, it is said, three years in Spain, in which country many of his masterpieces, such as *The Sleeping Venus*, *Christ in the Garden*, *St. Margaret*, and *The Dragon*, are still to be found. In 1537 he painted an altar picture, and in 1541 he produced *The Descent of the Holy Ghost on the Apostles*, *The Sacrifice of Abraham*, and *David and Goliath*. In 1543 he painted his picture of *The Virgin and St. Titian*; and in 1545 he visited Rome, where he painted the famous group of *Pope Paul III., the Cardinal Farnese*, and *Duke Ottavio Farnese*. He was patronized as warmly by Philip II. as by his father Charles V.

Of Titian's private life but little is known. He died of the plague in 1576, aged ninety-nine, having painted to the last with almost undiminished powers.

Titian excelled as much in landscape as in figure-painting, was equally great in sacred and profane subjects, in ideal heads and in nature. His pictures of religious subjects and others may have surpassed him in single points, none equaled him in general mastery. As a colorist he is almost unrivalled, and his pictures of man reach the perfection of sensuous beauty.

**References**.—Crows and Cavallazzi's *Life and Times of Titian*; Claude Phillips' *The Early Italian Masters*; and *The Italian Masters*; Morrell's *Italian Painters*; Runkin's *Modern Painters*.

**Titman, Otto Hilgard**, American scientist, was born at Belleville, Ill., 1850. He entered the United States Coast and geodetic survey in 1867. He was appointed to the international geodetic conference, Berlin, 1895; and superintended since 1900 United States Coast and geodetic survey. He was appointed to represent the United States at the demarcation of the boundary between Alaska and Canada in 1899, and was United States-Alaska boundary commissioner, 1904.

**Toqueville (to-ke-vil)**, Alexis Charles Henri Clerf, French statesman and writer, was born at Verneuil, 1788. He studied at the law, and was admitted to the bar in 1825. He became actively engaged in the study of the moral sciences, and of the French aristocracy. After 1838 he was the most formidable opponent of the first rule in opposition to the republic, as strenuously opposed Louis Napoleon. He became vice-president of the assembly in 1849, and from 1850-51 was minister of foreign affairs. Died, 1859.

**Todd, David P.**, astronomer, was born at Lake Umbagog, Me., 1825. He was graduated at Ph. D., Washington and Jefferson College, 1888; chief assistant on United States nautical almanac, 1878-81; professor astronomy and navigation and director of observations, Amherst College, since 1881. Astronomer in charge Lick observatory observations, transit of Venus 1882; professor astronomy and higher mathematics, Smith College, 1882-7; astronomer in charge American eclipse expedition to Japan, 1887; chief United States scientific expedition to West Africa, 1889-90; chief Amherst eclipse expedition to Japan, 1890, to Tripoli, Barbary, 1900, to the Dutch E. Indies, 1901, and to Tripoli, 1905; chief Mars expedition to the Andes, 1907. Author: *A New Astronomy*; *Solar System*; *Elements of Astronomy*. Designed and erected new observatories at Smith College, Northampton, 1889-7, and at Amherst College, 1890-1.

**Togo (to'-go)**, Admiral Count Metchiro, Japanese admiral, was born at Kogoshima, 1847. He first came into prominence as commander of the *Naniwa*, which sank the transport *Koushou*, and forced on the war with China. He was then a second time third in command of the fleet. At the close of January, 1904, he was selected to command the entire Japanese fleet in the hostilities against the *Caifu* fleet. The fleet of Japan was fought May 27-28, 1905, when of the fleet fifty-two ships were sunk, six captured, and the remainder dispersed and interned. Togo was made count in 1907.

**Tolstoy (tol'-stoy)**, Count Lyoff Nikolayevitch, Russian novelist, was born at Yasnaya Polyana in 1828. Studied at the University of Kasan; entered the army when twenty-three, was wounded at the Caucasus. He was promoted. Leaving the army soon after the close of the Crimean war, he devoted himself to literature. His first novel, *War and Peace*, is devoted to Napoleon in 1812, is regarded as his masterpiece; but his *Anna Karenina*, which appeared in 1877, is better appreciated. He declared "the evil" the keynotes of the Christian faith, and insists that the literal interpretation of the sermon on the mount is the only rule of life. He died in 1910. He deposited his *Memoirs and Diaries* with the curator of the Rumyantsev museum on the

condition that they should not be published until ten years after his death. He was excommunicated by the holy synod in 1901, and the same authority ordered all his works to be burned, celebrating his eightieth birthday in 1908. Died, 1910.

**Tombes, Robert**, American politician, was born in Wilkes county, Ga., 1810. From 1833 to 1861 he was a member of the United States senate. In 1861 he became secretary of the Georgia state federate government, but resigned to accept the commission of brigadier-general in the confederate army. He joined the army of General Johnston, and on his return to the South refused to take the oath of allegiance to the United States government. He died in 1886.

**Toothaker, Charles Robinson**, curator, was born at Philadelphia, 1873; graduate Central Pennsylvania Normal School, Philadelphia, 1890; received a degree in zoology under D. E. Cope; other special courses. Mineralogist in employ of A. E. Foss, Philadelphia, 1890-7; assistant curator, 1898-1904, curator since 1904, Philadelphia museum; lecturer on commercial geography; special instructor in commercial geography, Temple University, 1907-8; Consul for Republic of Colombia in Philadelphia. Author: *Commercial Raw Materials*, etc.

**Toranzo, Archbishop of, See Sweetman, Arthur**. Torricelli, Evangelista, Italian physicist and mathematician, was born probably at Fiesole, in the Romagna, 1608. He is celebrated for his discovery in 1643, and in 1644 for his improvements in lenses for telescopes. He died at Florence, 1647.

**Torshusen, Leonard**, count of Orjala, Swedish general, was born at the castle of Torshusen, Sweden, 1693. He accompanied Adolphus Frederick in 1694, and in 1695 was appointed to the command of the Swedish army in Germany. He died in 1691.

**Touchebent, Alexandre, Franz Eduard Ivanovitch**, Russian general and military engineer, was born 1818. Until he was severely wounded in the Crimean war he was in command and energy the defense of Sebastopol. During the Turkish war of 1877-78 he was called to defend Plevna, and was severely wounded in 1878, and was buried at Sebastopol. He wrote an admirable account of the defense of Sebastopol.

**Tourgey (toor-gee)**, Abner Wintner, American author, was born at Williamsfield, Ohio, 1838. Moved to North Carolina, where he was prominent in the reconstruction of the state, and up the constitution, and aiding in the revision of the laws. For some years prior to his death in 1905 he was United States consul at Bordeaux, France, and Halifax, Canada.

**Toussaint (to'-saint)**, (Jean-Pierre) L'Ouverture, Francois Dominique, Haitian general, was born in 1743, son of African slaves, in San Domingo. In 1796 he was elected generalissimo of the army of the army of San Domingo. When Bonaparte sought to restore slavery in San Domingo, Toussaint refused to surrender, and was sent to France, where he died in prison in 1803.

**Tower, Charles James**, American capitalist and diplomat, was born in Philadelphia, Pa., 1848. He was graduated at Harvard in 1872; LL. D. He lived in Duluth, Minn., 1883-87; was president of Duluth and Iron Range railroad and managing director of Minneapolis iron company. He was United States minister to Austria-Hungary, 1897; ambassador to Russia, 1899-1902; and ambassador to Germany, 1902-08. Author: *The Marquis de Fagundes in the American Revolution*.

**Troy, Crawford Howell**, university professor, was born at Norfolk, Va., 1836; graduated at the University of Virginia, 1858; studied at the University of Berlin, 1866-8; LL. D., University of North Carolina and Harvard. Professor of Hebrew, University of Virginia, 1860-1900; Greenville, South Carolina and Louisville, Ky., 1860-79; Hancock professor of Hebrew and other Oriental languages, University of Virginia, 1880-1900. Distinguished lecturer on biblical literature until 1903. Author: *The Religion of Israel*; *Quotations in the New Testament*; *Hebrew and Aramaic*; *Hebrew Text and English Translation of Esau's Commentary on Genesis*, etc.

**Trajan (tra'-jan)**, Marcus Ulpius Crinitus, Roman emperor, surnamed Optimus, was born at Italica, near Seville, A. D. 58. He was adopted by Nervus, 98 A. D. Trajan was invested with the imperial purple. In his civil capacity, he ruled for the welfare of the empire. He was a great actor, he sustained the glory of Rome. The column which bears his name was raised in the Roman forum to commemorate his victories. He died 117 A. D.

**Tree, Herbert Beerhohn**, English actor and manager, was born at London, 1824. He was known as was as the timid curate in *The Private Secretary*. He managed the Comedy theater in 1887, and produced *The Rose Tree*. In 1890, one of the same year assumed charge of the Haymarket theater. In 1897 he opened his new theater, His Majesty's. He was the first to introduce the great mystery of his success: *Herod*; *Ten Nights*; *The Merry Wives of Windsor*; *King Richard III.*; *Macbeth*; *Hamlet*; *Shakespeare*. He produced several of Shakespeare's plays in Berlin, and was greatly appreciated by the emperor.









system, was born in Tuscaloosa, Ala., in 1832. Fr. D. Ohio Wesleyan and Harvard; LL. D. He was one of the founders, in 1874, of the Chautauque assembly; founder, 1878, of the Chautauque literary and scientific circles. He was a member of the American Academy of Arts and Letters, and was chancellor ever since; in 1900 was made rector bishop in charge of European work of Methodist Episcopal church. Author of *Chautauque School; Studies in Young Life; Little Footprints in Bible Lands; Our Own Church; Outline History of the World; Outline History of the Family; Worship for Every Day in the Year*, etc.

**Vinci, (da vin' che), Leonardo da**, Italian painter, was born at the village of Vinci, near Florence, 1452. He was the third of the Leonardo da Vinci School of painting. Was educated in Florence, where he studied painting under Verrocchio. His unfinished *Adoration of the Kings* and his *Mona's Head* belong to his Florentine period. In 1482 he settled in Milan and to his Milanese period are ascribed his most celebrated productions—the two versions of *Our Lady of the Rocks*, and *The Last Supper*. He also founded an academy of arts, for which he wrote *Notes for a Treatise on Painting*.

Owing to the French occupation of Milan, in 1499, Leonardo returned to Florence, and was commissioned to write a treatise to decorate the council hall of the Signoria—paintings subsequently destroyed. The famous *Mona Lisa*, was painted in 1504. For ten years (1506-16) he resided alternately between Florence, Rome, and Milan, and painted his *St. Anne and St. John the Baptist*. Thereafter he accompanied Francis I. to France, and died 1519 in the Château de Cloux, Amboise, 1519.

A man of extraordinary physical beauty and of physical strength, his endless invention, his curiosity in science, and his careless quest after the ideal, made him a model for the small number of pictures finished by him. Of these, the *Last Supper* is practically destroyed through his experimentation with oil methods. But he created a systematic type of ideal female figure, sublimely beautiful, with the mysterious smile that has haunted and perplexed his students of succeeding generations.

**References.**—Browne's *The Life of Leonardo da Vinci*; Rio's *Leonard da Vinci et son École*; Henton and Black's *Leonardo da Vinci and his Age*; Houma's *Leonard da Vinci*; Richter's *Literary Works of Leonardo da Vinci*.

**Vinogradoff, (or vin'grad'off), Paul**, Russian educationist and writer, was born at Moscow, Oxford University, since 1903, was born at Kostroma, Russia, 1854. He resigned his chair in the University of Cambridge, England, in 1903, and resided his interrupted studies in English social and legal history. He was elected Corpus professor of jurisprudence in 1903. Author: *Villains in England; Inquiries in the Social History of England*; *English Society in the Eleventh Century*, etc.

**Virehow (vir'oh), Rudolf**, German pathologist, was born in Prussia, 1821. He was a member of the Prussian diet, 1862-1902; of the German Reichstag, 1880-93; became leader of the liberal opposition in the Prussian diet. In 1878 he retired from public life. His master work was *Cellular Pathology*, which laid the foundation of that branch of science. Died 1902.

**Virgil, See Vergil.**

**Victoria Colonna, See Colonna.**

**Vladimir (vlad'vay'ler), Alexander**, Russian emperor, who reigned from 980 to 1015. He added largely to the kingdom by conquest, but is best known for the introduction of Christianity into the empire. He died in 1015.

**Vost (voh), Karl**, German naturalist, was born at Göttingen, 1817. In 1849 he was made professor of geology at Geneva, and held that position to the time of his death, May 6, 1896. He wrote *Studies in Geology and Fossils; Essays on the Darwinian Theory*.

**Volta (voh'ta), Alessandro**, Italian physicist, was born at Como, 1745. He invented the voltaic pile, electrophorus, electrocopper, and condenser; discovered several new properties in electricity; was for thirty years professor of natural philosophy at Pavia.

**Voltaire, (voh'tair), the assumed name of François Marie Arouet**, French poet, dramatist, and philosopher, was the most celebrated writer of the eighteenth century, was born at Châtigny, near Paris, 1694, died there 1778. His father was François Arouet, a lawyer, and he was educated for the legal profession, but abandoned the law for letters. In 1718 a tragedy named *Oedipe* was brought out by him, and was a great success. It is said that this play was finished, and that

two cantos of his epic the *Henriade* were written in the Bastille, where he was confined from May 1717 to April 1718, for writing certain satirical verses on the regent. It was about this time that he adopted the name of Voltaire. In 1726 he was again imprisoned in the Bastille for sending a challenge to the Chevalier Rohan, by whom he had been grossly insulted. He was liberated within a month, and went to England on the invitation of Lord Bolingbroke. He resided till 1729 and acquired some knowledge of English literature. His *Henriade* was completed and published by subscription in England.

On his return to France he lived chiefly at Paris till 1734. During this period he raised himself from very moderate circumstances to a condition of affluence by successful monetary speculations. From 1734 to 1749 he resided with the Marchioness de Châtelet at Cirey, in Lorraine. She died in 1749, and Voltaire then accepted the oft repeated invitations of Frederick the Great to come and live at his court at Potsdam. Here he was received with great honor, but a series of disagreements with the king ended in Voltaire's retirement from the Prussian court in 1753. He then resided for a short time at Strasbourg, Colmar, and Lyons, removing at the end of 1754 to Geneva. For almost the whole of the remainder of his life he lived in Switzerland, or close to its borders. In 1760 or 1761 he fixed his residence with his niece, Madame Denis, at Ferney, where he received a constant succession of distinguished visitors, and maintained a correspondence with the intellectual and literary circles of the crowned heads of Europe. In 1778 he went to Paris, where he was received with enthusiasm by all classes. But the excitement of the occasion hastened his death.

His works embrace almost every branch of literature; poetry, the drama, romance, history, philosophy, and even science. Hatred of fanaticism and superstition was his dominant motive, and his near-sightedness are strongly animated by a spirit of hostility to the religion of his age. He upheld them, however, with as much zeal as he denounced them.

Voltaire's literary fame chiefly rests on his philosophical novels: *Zadig*, *Candide*, *L'Ingénu*, etc.; his histories: *Siècle de Louis XIV.*, *Histoire de Charles XII.*; his correspondence, and more than 10,000 letters, his poetical epistles, satires, and occasional light poems, which all exhibit wit, gaiety, vivacity, and grace. Several of his tragedies, such as *Zaire*, *Aïné*, *Méropé*, and *Mahomet*, had great success in their day, but are not assigned a high place in French literature. His comedies, the best of which is *L'Enfant Prodiges*, were less successful. His *Henriade*, an epic poem, had great success, and exercised a powerful influence when it first appeared, but is not highly esteemed now.

**References.**—The best lives are those by Diderot, Lessing, and James Paulding. See also Morley's *Voltaire*; biographies by Hamley, Epinasse, and Lounsbury's *Shakespeare and Voltaire*.

**Wade, Benjamin Franklin**, American statesman, was born at Springfield, Mass., 1800. He studied law, and became United States senator, 1851, 1857 and 1863. He opposed all the measures proposed as compromises between the North and South, and was expelled from getting the homestead bill through congress. After the death of President Lincoln, Wade was vice-president of the United States. Died at Jefferson, Ohio, 1878.

**Wadlin, Horace Greeley**, librarian of Boston, was born at Boston, 1805, was a bookbinder, 1805, was an architect in Boston, 1878. He was a member of the legislative house of representatives, and was supervisor of United States census, 1892-1900. Author: *Annual Statistics of Manufactures of 1890-1901*; *Decennial Census of Massachusetts for 1895*, etc.

**Wagner (voh'ner), Charles**, French Protestant clergyman and essayist, was born in 1822; he settled in Paris in 1882, and aroused great interest by his effective protest against the degenerating tendencies of Parisian literature and life in *Les Contes de la femme*, and in *Le roman expérimental*.

**Wagner, Wilhelm Richard**, the most celebrated of modern composers, was born at Leipzig 1813, died at Venice 1883. He received his education at Leipzig and Dresden.

From 1834 he filled various musical engagements at Magdeburg, Riga, and Königsberg. In 1839 he went to Dresden, and composed his operas *Rienzi* and the *Flying Dutchman*. The brilliant success of these operas secured him the conductorship of the Wagner royal court of Dresden in 1843.

He joined the insurrectionary movement of 1848-49, and was compelled to exile himself. Until his return to Germany in 1864 he spent most of his time in Switzerland. In 1868 he went to Bayreuth, and *Tristan and Isolde* appeared in 1865 and 1869 respectively. The king of Bavaria, Louis II., became an enthusiastic and liberal patron of Wagner, and the theatre at Bayreuth, especially built for Wagner, was chiefly supported from the king's purse. Here his famous tetralogy *Der Ring des Nibelungen*, consisting of *Das Rheingold*, *Die Walküre*, *Siegfried*, and *Götterdämmerung*, was first performed in 1876 before an unusually brilliant and appreciative audience.

About a year before his death he produced his last opera, *Parsifal*. In 1870 he had married, as second wife, Cosima von Bülow, a daughter of the Abbé Liszt. Wagner labored to reform dramatic music according to his theories of the drama, and gave his creations a national character by selecting his subjects from old German heroic legends. His theory was that in a perfect musical drama the three arts, poetry, music, and dramatic representation should be welded together into one well balanced whole. This theory he demonstrated with consummate ability and unsurpassed magnificence. His artistic views on music are embodied in a well-known work entitled *Oper und Drama*.

**References.**—Perhaps the best *Life* is Julien's. See also *Life* in Germany, by Hans Pohl, Tapert, and Wolzogen; Krebbs's *Studies in Wagnerian Drama*; Newman's *A Study of Wagner*; Froese's *Wagner as a Poet*; and Hoefer's *Richard Wagner and the Music of the Future*.

**Wainwright, Richard**, American naval officer, was born at Washington, D. C., 1849. He was graduated from the Naval academy in 1868; was assigned to the *Albatross*, 1869, and was destroyed in Havana harbor, February 15, 1868. After this he did good service at the battle of Santiago. Promoted to *Wagner* at 1891, and was superintendent of the naval academy, 1900-02; became a captain in 1903.

**Walbridge, (or wal'bridge), American** jurist, chief-justice of the supreme court of the United States, 1874-88, was born at Lyme, Conn., 1816. He was graduated from Yale in 1837, and practiced in Ohio. He was nominated by President Grant chief-justice of the United States supreme court, 1874, and served until his death in 1888.

**Walcott, Charles Doolittle**, American geologist, secretary of the Smithsonian institution since 1907, was born at New York Mills, N. Y., 1850. Assistant geologist to the United States geological survey in 1879 and director of United States geological survey, 1894-1907. He is a member of many scientific societies, and author of the following *Life in the Triassic*; *The Cambrian Fauna of North America*; *Pre-Cambrian Fossiliferous Formations*; *Correlation Papers*.

**Walden, (or val'den), Alfred von**, German general, was born in Potsdam, Prussia, 1832, and entered the German army in 1850, and was promoted to general in 1878. He was in the war; succeeded Moltke as chief of staff in 1888. In 1900 he was created field-marshal, and was appointed commander-in-chief of the German allied army engaged in suppressing the Boxer disturbances. Died, 1904.

**Waldstein (voh'den), Charles**, American archaeologist, was born in New York, 1856. He was educated at Columbia College and at Heidelberg. Made professor of Greek in 1878. Held the University, 1895-1901 and professor, 1895-97, American school of classical studies, Athens, Greece. Author: *The Second Punic War*; *The Age of the Surface of Things*; *The Jewish Question*; *The Archaic Heram*, etc.

**Walker, Francis Amasa**, American political economist, was born at Andover, Mass., 1807, was graduated from Amherst in 1826, took part in the civil war, and in 1865 rose to the brevet rank of major. He was a member of the institute, and was professor of political economy in the Sheffield scientific school at Yale, and in 1881 became president of the American Society of Political Economy at Boston. Author: *The Indian Question*; *The Wages Question*; *Money, Bimetallism*, and *History of the Second Punic War*, 1897.

**Wallace, Alfred Russel**, English naturalist and traveler, was born in Monmouthshire, England, 1822. He visited South America and the Malay

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**Watson, John**, Canadian educator and writer, was born at Glasgow, Scotland, 1847. He was graduated at Glasgow University, 1872; 1873, D. 1880; has been professor of logic, metaphysics, and ethics in Queen's University, Kingston, since 1872. Author: *Logic and Metaphysics*; *Practical Cosmology*; *Mind and Space*; *Idiosyncratic Theories*; *The Philosophical Basis of Religion*, etc.

**Watson, John**, American lawyer and politician, was born in Georgia, 1856. He was a member of the Georgia House of Representatives; member of congress, 1891-93; began the publication of *Tom Watson's Magazine*, in New York, 1905. Author: *The Slave's Life in England*, etc.

**Watson, William**, English poet, was born at Burley-in-Warstead, 1855; honorary LL. D., Aberdeen, 1904. His early poem, published in 1883, is the *Liverpool Argus* in 1875, and his first book, *The Prince's Quest*, appeared in 1880. Since then have appeared: *Epigrams of Art, and Nature*; *Odes*; and other forms: *The Purple East*; *Ode on the Coronation of King Edward VII.*; *For England*, etc.

**Watt, James**, Scotch engineer and, generally accredited inventor of the steam engine, was born at Greenock, 1736; and died at his seat of Houthill, Staffordshire, 1819. His father was a merchant and magistrate of Greenock, and James received a good education there. Having determined to adopt the trade of mechanical engineer, he went to be taught in London in 1754, for instruction, but ill-health compelled him to return after a year's apprenticeship. Shortly after he endeavored to establish himself in Glasgow, was appointed in 1767 mechanical-instrument maker to the university, and resided within its walls till 1763.

From this time till 1774 he acted as a civil engineer—made surveys, built bridges, canals, and harbors, and some of his plans were carried out. It was during this period that he gave shape to his chief improvements on the steam-engine. In order to produce the improved machine he associated himself with James Boulton, 1775) in business with Matthew Boulton—the firm of Boulton and Watt having their engine works at Soho, Birmingham. He retired from business in 1795.

Watt was a fellow of the Royal societies of London and Edinburgh, and member of the national institute of France. He was twice married, and was survived by one son, who carried on the establishment at Soho in partnership with a son of Mr. Boulton's. Besides improving the steam engine, Watt invented or improved a variety of mechanical appliances, including the centrifugal governor. Was an ardent student of chemistry, and it was long maintained on his behalf that he discovered the composition of water. He was a man of high mental powers generally, and possessed a wide and varied knowledge of literature and science.

**References.**—*Smiles' Lives of Boulton and Watt*; *Muirhead's Mechanical Inventions of James Watt*; *Thurston's The Growth of the Steam Engine*; and *Flemington's James Watt*.

**Watterson, Hector**, American journalist and orator, was born at Washington, D. C., 1840. He served with distinction in the Confederate army as chief scout under Lee in 1862. He was subsequently settled at Louisville, Ky., where he has made and has since edited the *Courier-Journal*, which he founded and was the greatest of the newspapers. At Chicago, in 1893, he delivered the dedicatory oration at the opening of the World's Columbian Exposition. He published a *History of the Spanish-American War*; *Oddities of Southern Life and Character*; *Abraham Lincoln*, etc.

**Watts, George Frederick**, English artist, sculptor, portrait painter, and delineator of historical subjects, was born at London, 1820. He was elected at the Royal Academy in 1837, and gained a reputation for the size, artistic excellence, and beauty of coloring of his pictures. His chief exhibits included: *Caractacus*; *Cymbeline*; *Faia Morgana*; *Life's Allusions*; *Sir Galahad*. Died, 1904.

**Watts, Isaac**, English hymn writer and theologian, was born at Southampton, England, 1674. His theological works were numerous. His version on *Logic* had a considerable reputation. His reputation has been chiefly perpetuated by his well known hymns. Died, 1748.

**Wayne, Anthony**, famous general in the war of the revolution, was born in Pennsylvania, 1733. Led the attack at Germantown, 1777, and was captured and detained at Valley Forge; achieved a brilliant victory in the storming of Stony Point, 1779. His courage and able leadership were recognized in 1780. By his dash and audacity he acquired the sobriquet of "Mad Anthony." He became major-general and commander-in-chief in 1792. Died, 1796.

**Weber (de'ber), Karl Maria von**, German composer, was born at Eutin near Lubeck, 1786, of a famed musical family. His first great production was *Der Freischütz*, which established his fame, and was followed by *Oberon*, his masterpiece. Died, 1826.

**Weber, Arthur Gordon**, American physicist, professor of physics, Clark University, was born 1863. He was graduated at Clark University, 1885. A member of many scientific associations, and author of: *A Mathematical Treatise on the Theory of Electricity and Magnetism*; and many papers on physics.

**Webster, Daniel**, great American statesman and orator, was born at Salisbury, New Hampshire, 1782. Daniel was the second son of Nathaniel Webster, a small farmer and justice of the county court. He entered Dartmouth College in 1797, and taught school in winter to pay his expenses. He graduated in 1801, and in 1804, went to Boston, and entered the law office of Mr. Gore. In 1805 he was admitted to the Boston bar, passed one year in the practice of his profession at Boscowan, and, on the death of his father, established himself at Portsmouth, N. H., and married in 1808.

Having engaged in politics as a member of the federalist party, he was elected to congress, where he immediately took rank with the foremost men of the country. He resigned his seat in the special session of May 1813, and on June 10, delivered his maiden speech on the repeal of the Berlin and Milan decrees. This, and his mastery of the question of currency and finance, secured him a high position. At the close of the session, however, Webster removed to Boston, where, during a period of seven years, he devoted himself exclusively to the practice of his profession, and occupied a prominent position as a counselor and advocate.

In 1822, he was a member of the Massachusetts constitutional convention; and on December 22, 1822, he pronounced at Plymouth the eulogy of the anniversary of the Pilgrims, the first of that remarkable series of discourses, or orations, which put him in the first rank among American orators. In 1825, he delivered an oration at the laying of the cornerstone of the Bunker Hill monument; in 1843, one on its completion. In 1826, he pronounced the eulogy of John Adams and Thomas Jefferson, two fathers and founders of the Union. In 1846, he who died on the same semi-centennial anniversary of the declaration of independence; and in 1851, a patriotic discourse on the laying of the corner stone for the extension of the Capitol at Washington.

In 1822, he was elected to Congress from Boston, and distinguished himself by his speeches on the holy alliance, and the Greek revolution, and his labors in the revision of the criminal laws of the United States. In 1826, he was chosen United States senator; and in 1830, rose to the height of his forensic renown, in a speech of two days, in the debate over Mr. Hayne, of South Carolina, on the right of "nullification." Webster and Hayne were the leaders of the opposition during the administration of Jackson and Van Buren.

In 1841, he became secretary of state under President Tyler, and remained in the administration of President Tyler until 1843; and was a third time secretary of state in 1850, in the cabinet of Mr. Fillmore. On various occasions Webster had been an unsuccessful candidate for the presidency. He acquired again to that position in 1852, but his advocacy of compromises on the slavery question had given offense to the abolitionists, and the choice of the convention assembled at Baltimore fell upon General Scott. The great orator died a few months after, October 24, 1852.

Webster's figure was commanding; his countenance was remarkable even in repose, but when animated by the excitement of debate, it "spoke no less audibly than his words." His gestures were vehement, without being undignified; and his delivery, unrivaled in power, in clearness, and in modulated variety of tone.

**References.**—*The Writings and Speeches of Daniel Webster* have been published in 18 volumes, of which 13 vols. are complete. See also *Life of Daniel Webster*; *Harvey's Reminiscences of*

*Daniel Webster*; *Lodge's Daniel Webster*; *McMaster's Daniel Webster*; *Wheeler's Daniel Webster*; *The Encyclopedia Americana*.

**Webster, John**, English dramatist, was born about 1650. He collaborated with a number of writers of the day, and then produced the tragedy of *The White Devil*, one of his two great masterpieces, about 1635, and about 1616 his famous *Tragedy of the Dutch Merchant*.

**Webster, Noah**, author and philologist, was born at Hartford, Conn., 1758, and was educated at Yale College, 1776, and then studied in Yale. While employed in teaching at Goshen, N. Y., he prepared his *Grammatical Institute of the English Language*, 1807, he published then *Philosophical and Practical Grammar of the English Language*, which commenced his *American Dictionary of the English Language*, 1828. He was a student of the Greek, he devoted ten years to its study, and prepared a *Synopsis of Words in Twenty Languages*; then began his dictionary, and in seven years completed it. Died in New Haven, Conn., 1842.

**Weed, Thurlow**, American journalist, was born at Cairo, N. Y., 1797. He served as a volunteer in the war of 1812. In 1805 he moved to New York city and became editor of the *New York Times*, and afterward of the *Commercial Advertiser*. In 1810-12 he went to Europe on a special mission by President Lincoln. Died at New York in 1862.

**Weir (weir), Robert Walter**, American painter, was born at New Rochelle, N. Y., 1803. After studying in Italy several years he was made professor of painting in the University of California, 1837, and remained for twenty-two years. His best known works are *Portrait of Henry Hudson*, *Columbus before the Council*, etc. Died, 1889.

**Westwood (we'st-wood), Augustus**, German biologist, was born at Frankfurt, 1834. He contends that natural selection is the dominant factor in evolution. He has written, besides the *Romance* lectures of 1894, *The Evolution of Theory* and works on kindred problems.

**Wells, William Henry**, American physician and pathologist, professor of pathology at Johns Hopkins, was born at Norfolk, Conn., 1830. He graduated at Yale in 1850; M. D., 1855; professor of pathology, Johns Hopkins, 1884; and pathologist to the Johns Hopkins Hospital, 1889. He is the author of *General Pathology of Fever*.

**Wellington, Arthur Wellesley, Duke of**, celebrated British general, was born at Dangan Castle, Ireland, 1769; entered the army as ensign, 1787, and became lieutenant-colonel in 1793. It was in the battle of Assaye, in 1803, that he first gained fame. In 1814 he was created marquis of Douro and duke of Wellington. He was then appointed commander-in-chief of the British army in Europe, and from Vienna joined the army at Brussels. The battles of Ligny and Quatre Bras were fought on June 16 and 18, 1815, and the great battle of Waterloo. Here the grand duke was blown from his horse, and the power of Napoleon was annihilated. At the battle of Waterloo, in 1815, he was struck at Lord high commander of England. In 1827 he succeeded the duke of York as commander-in-chief of the British army, and from 1828 to 1830 was prime minister. Died at Walmer Castle, in 1852.

**Wells, Carolyn**, author, was born at Rahway, N. J., daughter of William E. Wells, and has been engaged in literary work since 1895. Author of: *The Sign of the Sphinx*; *The Garden of Marjorie's Vocation*; *Rainy Day Disasters*, etc.

**Wells, David Ames**, American economist, was born at Springfield, Mass., 1828. He was graduated from Williams College. Among his published works are text-books on *Science of Common Things*; *Recess Economy*; *Manual of the Principles of Political Economy*; *Principles of the Science of Production*; *Our Merchant Marine*. Died at Norwich, Conn., 1898.

**Welsh, Martine George**, English novelist, was born at Bromley, Kent, 1856. He was graduated at the Royal college of science, 1888. Author: *The Sign of the Sphinx*; *The Garden of Marjorie's Vocation*; *Rainy Day Disasters*, etc.

**Wendell, Barrett**, American editor, critic and critic, professor of English at Harvard since 1896, was born at Boston, 1855. He was graduated at Harvard, 1877; Ph. D., 1880. He was a lecturer at the Sorbonne and other French Universities, 1904-05. Author: *English Composition*; *Life of Col. Matthew Smith*; *Life of Col. Smith*; *Concerning America*; *The Temper of the Seventeenth Century in English Literature*; *History of Literature*.

**Wenley, Robert Mark**, American educator, head of philosophical department, University of Michigan, was born at New York, 1861. He was graduated at the University of Glasgow, M. A., 1884; Ph. D., Sc. D., L. L. D., University of Michigan, 1890. He was co-editor of *Dictionary of Philosophy*, etc. Joint author: *The Psychological Review*.

**Wernicke, Wilhelm**, German geologist, was born at Wernicke, Germany, 1800. He was a geologist, and extended his reputation throughout Europe. In his mineralogical system minerals were distinguished by their chemical composition and their external characters. He died at Dresden in 1817.

**Wesley, Charles**, English hymn writer, was born at Epworth, England, 1708, and was associated with his brother John in the Methodist movement. He is the author of a great number of hymns, many of which are among the best and most admired in the English language. He died 1791.

**Wesley, John**, English divine, who, with Whitefield, founded Methodism, was born at Epworth, 1703, and at Oxford and at the University, he and his brother, with a few other students, formed themselves into a society for the purpose of mutual edification in religious exercises. So singular an association excited considerable notice, and among other names bestowed upon the members, that of *Methodists* was applied to them. Wesley with some others, chiefly Moravians, came to Georgia in 1735, but at strictness of discipline which he attempted to introduce proved very distasteful to the colonists. After a residence of less than two years in America, he returned to England, preaching to open air meetings, and gathered many followers. He built spacious meeting houses in London, Bristol, and other places.

For some time he was associated with George Whitefield, but differences arising on account of the doctrine of election, which was zealously espoused and preached by the latter, they separated, and the Methodists were denominated according to their respective leaders.

Wesley was indefatigable in his labors, and was almost continually engaged in traveling over England, Wales, Scotland, and Ireland. No man ever labored more zealously or continuously in the cause which he had undertaken. Every moment of his life was devoted to the organization of the great sect of Methodists, and his influence over his followers was to the last. His preaching was extemporaneous, but not vehement. He dwelt much upon practical religion, though he taught his followers to seek inspiration of the Holy Spirit, and to a state of sinless perfection. Died in London 1791.

**References.**—Perhaps Wesley's best single treatise were his *Notes on the Old and New Testaments*, and his *Doctrine of Original Sin*. His complete *Works*, with a *Life* by T. Boehman, and a *Portrait* by J. Jackson, have been printed in 15 volumes. *Lives of John Wesley* have been written by Southey, Tyerman, Wedgwood, Telford, and Southey, and Wesley's *Life* by Southey and his *Centenary*, by Dr. Fitchett.

**West, Benjamin**, American painter, was born at New York, 1738. He was a portrait painter for seven years of age, worked in Philadelphia and New York, studied in Italy, 1760-63, and settled in England in the latter year. Among his best paintings are: *The Death of Wolfe*; *Christ Healing the Sick*; *Death on the Pale Horse*, etc. Died in London in 1820.

**Westcott, Brooke Foss**, English prelate, writer, and biblical scholar, was born near Birmingham in 1825; regius professor of divinity at Cambridge and in 1890 was appointed bishop of Durham. His writings embrace: *History of the Canon of the New Testament*; *The Gospel of Life*; *Social Aspects of Christianity*; *Characteristics of the Gospel Miracles*; *New Testament in the Original Greek*. Died, 1901.

**Westinghouse, George**, American inventor and manufacturer, was born in New York in 1816. In 1860 he invented and successfully introduced the Westinghouse air brake, which he has since greatly improved. He was the pioneer in introducing alternating current electricity in America, built the great generators at Niagara Falls and those for the Atlantic railway and rapid transit system in New York.

**Wilmore, George Feabody**, United States senator, was born during a visit of his parents abroad, at London, England, 1847. He was graduated at Yale College, 1867. He is a trustee of the Wesleyan education fund, was governor of Rhode Island, 1888-90; 1897-7; clerk of the United States senate, 1894, 1891 and 1890.

**Wynne, Stephen**, English novelist, was born at Ludlow, 1805. In 1800 he published *The House of the Wolf*, followed by *Francis and his Friends*. He was himself famous by *A Gentleman of France*.

**Wheatstone, Sir Charles**, English physicist and mathematician, was born at Gloucester, England, 1802. Invented the telegraph, the barometer and barometer; secured first patent for an electric telegraph; and an apparatus for conveying intelligence to engineers and steamboat boards large steam-vessels. He is well known for the Wheatstone bridge. Died, 1875.

**Wheeler, Benjamin Eli**, American educator and philologist, president of the University of California since 1899, was born at Randolph, Mass., 1854. He was graduated from Harvard University

1875; Ph. D., LL. D., Harvard, 1900; professor of Greek, 1888, at Cornell. Author: *The Greek Vowel-Accent*; *Analogy in Language*; *Organization of Language* in the University of Chicago.

**Wheeler, Joseph**, American general was born in Augusta, Ga., 1836. He was graduated at the United States Military Academy, serving in the cavalry until the outbreak of the civil war, when he entered the confederate army, in which he was later commissioned major-general and senior commander of cavalry; was made major-general of volunteers during the Spanish-American war, 1898. He was appointed major-general in 1903, and was retired the following September.

**Whipple, Edwin Percer**, American author, was born at Gloucester, Mass., 1819. In 1872 he became literary editor of the *Boston Globe*. In 1877 wrote for the *North American Review*, his publications include: *Essays and Reviews*; *Literature of the Age of Elizabeth*, etc.

**Whistler, James Abbott McNeill**, noted American painter, was born in Lowell, Mass., 1834. He entered the United States military academy but was dismissed; studied drawing and painting in Paris, France, and in 1863 settled in London, England. He gained celebrity as an artist. His best known works are: *Portrait of My Mother*; *Nocturne in Blue and Gold*. Died in London, 1903.

**White, Edward Douglass**, American jurist, was born in the parish of Lafourche, La., 1845. He was educated at Mount St. Mary's College, Maryland, and at the Jesuit College in New Orleans. During the civil war he served in the confederate army, 1862-63. He was appointed associate justice of the United States supreme court in 1894 and chief justice, 1910.

**White, William**, American journalist, was born at Colebrook, N. H., 1834. He was graduated at Beloit College, Wis., 1853; from 1883 to 1903 was editor of the *New York Herald*, and was president of the company, editorial writer, and editor-in-chief. Author: *Money and Banking*; *History of the United States*; *The Roman History of Appian*, etc.

**White, Horatio Stevens**, professor of German at the University of Wisconsin, was born at New York, 1829. He was graduated at Harvard, 1873; LL. D.; head of German department, 1891-1902; dean University library, 1896-1902; Cornell University, 1902 he became professor of German at Harvard. Edited: *Selections from Lessing's Prose*; *Selections from Heine's Poems*; *Selections from German Prose Composition*; and *Deutsche Volklieder*.

**White, James William**, American physician and surgeon, was born in Philadelphia, Pa., 1851. He was graduated at the University of Pennsylvania, M. D., Ph. D., LL. D. He was resident physician of Philadelphia hospital, 1873; is now John Rhea Barton professor of surgery, University of Pennsylvania. Joint author: *American Surgery*; *Principles of Surgery*.

**White, Richard Grant**, American author and critic, was born in New York city, 1821. He was a member of the editorial staff of the *New York Times*. The result of his studies and writings on music and art was a volume on *Christian Art*. He was a contributor to the *Century*. Author: *Poetry of the Civil War*; *Life of Shakespeare*; *Studies in Shakespeare*, etc. He died, 1885.

**White, Newell Adams**, American geologist, was born in Grand Rapids, Mich., 1873; Ph. B., University of Michigan, 1895. He is a frequent contributor to the *Geological Survey of the United States*. Author: *The Blasted Trail*; *The Forest*; *Blasted Trail Stories*; *The Forest*; *Camp and Trail*.

**White, William Allen**, American journalist and author, owner and editor of the *Emporia Daily and Weekly Gazette*, was born 1868. Author: *White's Weekly*; *White's Almanac*, *Strangers and Spots*; *A Certain Rich Man*, etc.

**Whitfield, George**, one of the founders of Methodism, was born in Northampton, Mass., 1714. He was educated at Oxford. One of his most famous missionary journeys was that which he made to America, several of which lasted for two or three years. He died at Newburyport, near Boston.

**Whitman, Walt**, American poet, was born in 1819 at Westhill, L. I. He learned the printing trade, and was employed by the *Brooklyn Daily Eagle* and papers and magazines. Later he became a newspaper publisher for a year; in 1846, he became for one year publisher of the *Brooklyn Daily Eagle*, which he traveled widely in the United States and

Canada. In 1855 appeared his first collection of *Leaves of Grass*. Later he produced his *Democratic Vistas*, *Drum*, *Rivulets*, and *Specter*, *Days and Nights*. He died at Camden, N. J., 1895.

**Whitney, Eli**, American inventor, was born in Westborough, Mass., 1793. In 1792 he was graduated at Yale University, and spent some time owing to litigation growing out of the claims of fraudulent inventors, and despatching of obtaining his rights. He finally went to New Haven, Conn., 1798, near which city he became engaged in the manufacture of firearms. He died 1859.

**Whitney, Josiah Dwight**, American biologist, was born at Northampton, Mass., 1819. He was graduated at Yale University, and was a professor at Harvard. He wrote extensively on geological topics, and died in 1906.

**Whitney, William**, American philologist, was born at Northampton, Mass., 1827. In 1854 he became professor of Sanskrit at Yale, and in 1870 also of comparative philology. He waged war with Max-Müller on fundamental questions of the science of language. Among his works were: *Material Form in Language*, *Life and Growth of Language*; *Mixtures in Language*, etc. He was editor-in-chief of the *Century Dictionary*. Died at New Haven, 1894.

**Whittier, John Greenleaf**, American poet, was born of Quaker parents at Havorthall, Mass., 1807. In his youth he was a farmer, and learned the shoemaking trade. He carried on the farm himself for five years, and in 1830-36 he was a shoemaker. He was a Quaker and always remained an ardent abolitionist. Among the numerous volumes of poetry which he has written are: *Drum*, *Drum*, *Fishes*; *The Voice of Freedom*; *The Chapel of the Hermits*; *Snow-Bound*; *In War-Time*; *Hazel Blossoms*; *Myself*; *Myself*, etc. He is best known for his poems, *Barbara Fuchs*, *The Barefoot Boy*, *Myself*, *Myself*, etc.

**Wickersham, George Woodward**, American lawyer, attorney-general of the United States since 1890, was born at New York, 1828. He was a graduate of the University of Pennsylvania 1850; he removed to New York city, and in 1853 entered the law office of John Jay. He was admitted, four years later, to partnership in the firm, which connection he terminated upon becoming attorney-general.

**Wieland (volland), Christoph Martin**, noted German poet, was born at Oberholzhorn, near Biberach, 1733. He was a member of the *Sturm und Drang* movement, and was especially noted in the didactic poem *Maximus*, a work of singular grace and harmonic treatment. He wrote the *Choice of Hercules*. Died, 1812.

**Wiggin, Kate Douglas**, American author, was born in Philadelphia, 1861. She was graduated at Abbott Academy, Andover, Mass., 1878, and married Samuel Wiggin in 1880 and George C. Rice in 1881. She has written: *Myself*; *The Story of Pagan*; *Pagan Oliver's Problem*; *The Village Black Tavern*; *The Diary of a Goose Girl*; *Rebecca*; *The Fair at the Inn*.

**Wilberforce, William**, English statesman and philanthropist, was born at Hull, England, 1759. He was educated at St. John's College, Cambridge. He entered parliament as the representative of his native town. In 1789 he first proposed in the house of commons the abolition of the slave trade, and with the aid of Charles James Fox, this measure was carried in 1806. Died 1833 and was buried in Westminster abbey.

**Wilcox, Ella Wheeler**, American poet and writer, was born near Madison, Wis., 1855, and was educated at the State University of Wisconsin. For many years she has been on the staff of the *New York American*.

**Wiley, Henry**, American chemist, was born at Kent, Ind., 1814; graduated at Hanover College, 1837; M. D., Indiana Medical College; B. S., Harvard University, 1840; Ph.D., 1842; was 1850; professor of chemistry, Purdue University, and state chemist of Indiana, 1874-83; chief chemist, United States Department of Agriculture, 1883-1910; professor agricultural chemistry, George Washington University, since 1899; consulting professor in Indiana Polytechnic Institute, 1902. Author: *Principles and Practice of Agricultural Chemistry* (3 volumes); *Foods and Their Adulterations*; *Nutrition*; *Government Laboratories*; *Handbook and twenty-five scientific papers*, etc.

**Wilhelmine (Wilhelmina)**, *Helene Pauline Marie*, German empress, was born at Schleswig, Holstein, 1840. She succeeded to the throne of the Netherlands on the death of her father in 1890. She was crowned as empress in 1890, when she was inaugurated as queen. In 1901 she married Prince Henry, youngest son of the late king of Denmark. She was born in England, 1869, in the *Lady of Lyons*. She has toured the United States in *Diana Gurney*, *Tom Funck*, *From London to London*, etc.

**Willard, Emma C.**, American educator, born at Berlin, Conn., 1857. In 1908 she married Dr. John Willard, president of the Brooklyn College, and by her efforts a school for the training of





adorn the triumph of her conqueror. She was a woman of great courage, high spirit, and remarkable beauty.

**Zimmerman, Helen**, British author, translator, and critic, was born in Hamburg, Germany, in 1846, and was taken to England in 1850. She resided in England until 1887, when she removed to Italy, where she has since lived. Author: *Previous Sinners*; *Gold in the Desert*; *Half-Hours With Famous Novelists*; *Tales From the Bible*; *The Italy of the Italians*, etc.

**Zinzendorf (von-bor-dorf), Nicolaus Ludwig, Count von**, founder of the Moravian brethren, was born at Dresden, 1700. He accidentally met a wandering coppersmith named Christian David, a member of the old sect of Moravian brethren, who described the persecutions to which the sect was exposed, and Zinzendorf invited him and his friends to settle on his estate. They accepted the proposal, and the colony received the name of "Herrnhut." In 1727, at the request of King Frederick William I. of Prussia, he was ordained bishop of the Moravians. In 1741 he went to America and founded the celebrated Moravian colony at Bethlehem, Pa. Died, 1760.

**Ziska (z'ska), or Ziska (zisk'ska), Jan**, leader of the Hussites, was born at Trencov, Bohemia, about 1360. He was an adherent of the Hussite doctrine. Died, 1424.

**Zola (z'ola), Fr. st'di**, Emile, French novelist, was born at Paris, 1852. He was educated at the Lycée St. Louis. His first important venture in fiction was *Les Mystères de Marseille*. Soon after this he formed with Flaubert, Daudet, and the Goncourts the naturalistic school of fiction. The fruit in part of this was the series known as

*Les Rougem-Macquet Family*. His latest work, written in exile, created by his courageous advocacy of the famous Dreyfus case, is entitled *Le Capitaine Corcoran*. He was a knight of the French legion of honor. He died in 1902.

**Zoroaster** (Old Persian *Zarathustra*, later *Per. Zerdusht*), was one of the great religious teachers of the east, the founder of the Persian religion, now known as Zoroastrianism. He has been represented by eminent authors as purely mythical, but it seems more reasonable to believe that he was a real, historical personage. If this view be accepted he was probably a native of the east of Persia, but there is great uncertainty as to the time in which he appeared as a religious teacher. He is supposed by some to have been a contemporary of Moses, by others his data is assigned to the tenth century before Christ.

His doctrines are to be found in the Parsee scriptures called the *Zend-Avesta*, and the *Gōdās*, which is the oldest part of that work, are declared to contain his authentic utterances. The fundamental idea of his doctrine was the existence, since the beginning, of a spirit of good, Ahurā Mazdaō (Ormuzd), and a spirit of evil, Angrō Mainyush (Ahriman). These two are in perpetual conflict, and the soul of man is the great object of the war. Ormuzd created man free, so that if he allows himself to fall under the sway of Ahriman he is held to be justly punishable.

When he dies his good and evil deeds will be weighed against each other, and accordingly as the balance is struck he will be sent to heaven or to hell. If they are exactly equal, the soul passes into an intermediate state, and remains there until the day of judgment. Ormuzd is to triumph ultimately, and then there will be one undivided kingdom of God in heaven and on earth.

The religion of Zoroaster, when it became that of Iran, was expounded by a widely spread priesthood, and these provided for it a ritual and ceremonial. Minutely elaborated laws for the purification of soul and body were laid down. They included a prohibition of the burning or the burying of the dead bodies of believers, which, by the Parsees in Bombay and elsewhere, are still left to be devoured by vultures.

**References.**—Jackson's *Zoroaster, the Prophet of Ancient Iran*; Windichmann's *Zoroastriace Gedenken*; and *Die Iranische Religion*; Max Müller's series of translations of books of the orient, especially the *Zend-Avesta*.

**Zwingli (zwing'li), Ulrich**, Swiss reformer, was born at Wildhaus, 1484. In 1519 he was appointed to the cathedral at Zürich, having previously opposed the sale of indulgences by 'Lutherism.' Attempts were made to prohibit his preaching, but the reformation grew at Zürich. In 1529 Zwingli met Luther at Lichfield at Marburg, but two years later he fell in the battle of Kappel in the war with Bern. Died, 1531.

### HALL OF FAME FOR GREAT AMERICANS

The building known by the above title stands on University Heights, New York, and is affiliated with New York University. It was erected from a fund of \$350,000 given for that purpose by an unknown donor. The structure is a semicircular colonnade connecting the Hall of Philosophy with the Hall of Languages, containing 150 panels for inscriptions and six compartments for mention of those persons whose names are inscribed upon the panels.

The terms of the gift prescribed that fifty panels were to be filled in 1900, and five at the close of each half decade thereafter. Only names of native Americans who have been deceased at least ten years may be chosen. Later provisions included suitable commemoration of great Americans of foreign birth, as well as a hall of fame for women.

In 1900 nominations were invited from the public, and submitted to a committee of 100 distinguished citizens for designation. The action of that committee, and subsequent committees, resulted in the choice of the following persons:

NAME	WHERE BORN	DATE OF BIRTH AND DEATH	EDUCATED	VOCATION
John Adams	Quincy, Mass.	1735-1826	Harvard	Statesman.
John Quincy Adams	Quincy, Mass.	1767-1848	Harvard	Statesman.
Lois J. B. Agassiz	Switzerland	1807-1873	University of Munich	Naturalist.
Sam James Aikin	St. Louis, Mo.	1793-1851	France	Orator.
George Bancroft	Worcester, Mass.	1800-1891	Harvard	Historian.
Henry Ward Beecher	Litchfield, Conn.	1813-1887	Amherst	Preacher, Orator.
Phillips Brooks	Boston, Mass.	1835-1893	Harvard	Preacher.
William Cullen Bryant	Cumington, Mass.	1794-1878	Williams College	Poet.
Henry Clay	Newport, R. I.	1790-1842	Harvard	Preacher, Essayist.
James Fenimore Cooper	Hanover Co., Va.	1777-1852	Elementary	Statesman.
Peter Cooper	Burlington, N. J.	1789-1851	Yale	Novelist.
Jonathan Edwards	New York City	1791-1863	Elementary	Philanthropist.
Ralph Waldo Emerson	Windsor, Conn.	1803-1882	Yale	Theologian, Preacher.
David Glasgow Farragut	Boston, Mass.	1803-1882	Harvard	Essayist, Philosopher.
Benjamin Franklin	Mr. Knowlton, Tenn.	1680-1790	United States Navy	Admiral.
Robert Fulton	Little Britain, Pa.	1765-1815	Politechnic	Statesman, Writer.
Ulysses Simpson Grant	Point Pleasant, Ohio	1822-1885	West Point	Inventor.
Ann Gray	Paris, N. Y.	1810-1888	Fairfield College	Soldier, Statesman.
Alexander Hamilton	Nevia Island, W. I.	1757-1804	Columbia	Statesman.
Nathaniel Hawthorne	Salem, Mass.	1804-1864	Hawdon College	Novelist.
Oliver Wendell Holmes	Cambridge, Mass.	1809-1894	Harvard	Poet, Physician.
Washington Irving	New York City	1783-1859	Academic and Legal	Novelist, Diplomat.
Andrew Jackson	North Carolina	1767-1845	Elementary	Soldier, Statesman.
Thomas Jefferson	Shadwell, Va.	1743-1826	William and Mary	Statesman.
John Paul Jones	Arbigland, Scotland	1747-1792	Elementary and Naval	Naval Officer.
James Kent	Westmoreland Co., Va.	1807-1870	West Point	Lawyer, Jurist.
Robert Edward Lee	Hardin Co., Ky.	1807-1865	Self-educated	Soldier.
Abraham Lincoln	Boston, Mass.	1809-1861	South College	Poet, Diplomat.
Henry Wadsworth Longfellow	Boston, Mass.	1819-1891	Harvard	Poet, Diplomat.
James Russell Lowell	Buckland, Mass.	1817-1849	Academic, Private	Educator.
Mary Lyon	Stratford, Conn.	1793-1826	Yale	Statesman.
Horace Mann	Franklin, Mass.	1796-1859	Brown University	Educator.
John Marshall	Fauquier Co., Va.	1753-1835	Privately	Jurist.
Maria Mitchell	Charleston, Mass.	1818-1889	Privately	Astronomer.
Samuel Finley Breese Morse	Charleston, Mass.	1791-1872	Yale	Inventor, Artist.
John Lothrop Motley	Dorchester, Mass.	1814-1877	Harvard	Historian, Diplomat.
George Peabody	Southey, Mass.	1795-1869	Harvard	Merchant, Philanthropist.
Edgar Allan Poe	Boston, Mass.	1809-1849	West Point	Poet, Romanist.
William Tecumseh Sherman	Lancaster, Ohio	1820-1891	West Point	Soldier.
Joseph Story	Litchfield, Conn.	1783-1845	Harvard	Jurist, Law Writer.
Harriet Beecher Stowe	Litchfield, Conn.	1811-1896	Litchfield Academy	Novelist.
Gilbert Stuart	Narragansett, R. I.	1755-1828	London, with West	Portrait Painter.
George Washington	Westmoreland Co., Va.	1732-1799	Academic	Soldier, Statesman.
Daniel Webster	Salisbury, N. H.	1782-1852	Dartmouth College	Orator, Statesman.
El Whitney	Westboro, Mass.	1765-1825	Yale	Inventor.
John Greenleaf Whittier	Massachusetts	1807-1893	Amherst College	Poet.
Kenneth Willard	Berlin, Conn.	1787-1870	Harvard Academy	Educator.
Frances Elizabeth Willard	Churchville, N. Y.	1820-1898	Northwestern Female College	Temperance Reformer.
Roger Williams	London, Eng.	1604-17-1683	Cambridge, Eng.	Religious Reformer.















































accounts for the same being given to eight places in the country.

**brash** (brash), *adj.* brittle, as wood. [*Collage, U.S.*]

**brash** (brash), *n.* broken, loose, and shaggy fragments of rock underlying alluvial deposits.

**brass** (brass), *n.* [*pl. brasses* (brasses)], an alloy of copper and zinc.

**brassy** (brassy), *adj.* pertaining to, or resembling, brass; impudent; brazen.

**brat** (brat), *n.* a child used contemptuously.

**brat-fishing** (brat-fish-ing), *n.* an ornamental open-work; creating.

**bravado** (brav-ə-dō), *n.* [*pl. bravados* (dōs)], arrogant manner; defiance.

**brave** (brave), *adj.* bold; courageous; intrepid; making a fine show; an Italian warrior.

**Syn.** BRAVEY, valiant. *Gallantry* is extraordinary bravery or bravery on extraordinary occasions; the brave man goes bravely where he is commanded; the gallant man leads on with vigor to the attack. *Bravery* is common to vast numbers and whole nations; *gallantry* is peculiar to individuals or particular bodies.

**Ant.** Fear, cringe, shrink, tremble.

**brav-er** (brav-er), *n.* the quality of being brave.

**Syn.** BRAVEY, courage, valor. *Bravery* lies in the blood; *courage* lies in the mind; the latter depends on the reason, the former on the physical temperament; the first is a species of instinct, the second a virtue; *valor* lies in proportion to the force of the mind; *bravery* is without thought; *valor* is a higher quality than either *bravery* or *courage*, and seems to partake of the characteristics of both.

**Ant.** Fear, pusillanimity, cowardice.

**brav-er-y** (brav-er-y), *adv.* well done; good; a cheer.

**brav-er-y** (brav-er-y), *n.* a cheer of great brilliant style, adapted to display the skill of the performer, or the range and flexibility of a singer's voice.

**bravi** (bravi), *n.* *cf.* to quarrel noisily and outrageously. [*FEUD*]

**brawl** (brawl), *n.* full, strong motion; boxer's fight, especially when collared and otherwise prepared.

**brawn-y** (brawn-y), *adj.* muscular; tough.

**bray** (bray), *n.* *cf.* to beat, to bray, *p.* braying, to pound or beat fine or small.

**brase** (brase), *s.* *cf.* to solder with brass; cover or ornament with brass.

**brass** (brass), *adj.* made of brass; pertaining to brass.

**brash** (brash), *n.* an open pan for burning charcoal.

**brasil** (brasil), *Port.* *brasil* (brasil). Named, on account of the color of its tree-wood, from a tree, "live coal." A republic of South America.

**brasil nut** (brasil-nut), *n.* the seed of a tree of Brazil (tree).

**Brasas** (brás-sa) *river*, *Tex.* As named by the Spaniards *Brasas de Dios*, "arm of God." The river established a mission on its bank some thirty miles from the mouth of the San Sabá, and the guard having been called away, the Indians descended on the mission, and commenced its destruction. When the soldiery returned, their loss was quickly discovered, and, searching for a solution, they found in the river many of the dead bodies of the depredators, still floating in its eddies; as they could discern no marks of violence, they pronounced it a restorative miracle done by the "arm of God."

**breach** (breach), *n.* the act of breaking; the violation of a law, contract, or any other engagement.

**Syn.** BREACH, break, gap, chasm. *Breach* and *gap* are the consequence of a violent removal, which destroys the connection; a *break* and *chasm* may arise from the absence of that which would form a connection. A *breach* in a wall is made by means of cannon; *break* in fences are usually the effect of some violent effort to pass through; a *break* is made in a piece of printing by leaving off in the middle of a line; a *chasm* is left by cutting away any words in the sentence are omitted. [*See break*]

**break** (break), *n.* food made from ground grain; food in general.

**break-fruit** (break-fruit), *n.* the fruit of a tree growing from a broken branch.

**break-stuff** (break-stuff), *n.* a grain, flour, or meal from which bread is made.

**break** (break), *n.* the measure of any surface from side to side.

**break** (break), *s.* [*pl. p. broke, p. p. broken, p. p. broken*], to break; to break up; to interrupt; *p.* break; to rupture; an interruption.

**Syn.** BREAK, burst, crack, split. To *break* does not imply any particular manner or form of action; what is broken may be broken in two or more pieces, broken short or lengthwise, and the word *break* is broken as readily as any other word, frequently also with noise. To *crack* and *split* are modes of breaking lengthwise; the former being used in relation to a hard substance, and the latter in relation to the latter in application to wood. [*See break*]

**break-age** (break-age), *n.* the act of breaking; allowance for accidental fracture.

**break-down** (break-down), *n.* a collapse; failure.

**break-or** (break-or), *n.* one who, or that which, breaks. [WAVE]

**break-fast** (break-fast), *n.* the first meal in the day, break-fast (break-fast), *n.* any structure to break the force of the waves.

**break-water** (break-water), *n.* a broad-shaded fresh-water fish; sunfish; marine fishes of different varieties.

**breast** (breast), *n.* the fore part of the body between the neck and the abdomen.

**breast-plate** (breast-plate), *n.* a portion of armor covering the front of the body.

**breast-plate** (breast-plate), *n.* a hastily constructed work, thrown up breast-high for defense.

**breath** (breath), *n.* the air inhaled and exhaled in breathing.

**breath** (breath), *s.* to inhale air and expel it from the lungs; live; take breath.

**breath** (breath), *n.* respiration; air in gentle motion.

**breach** (breach), *n.* the buttocks; the hinder part of the body.

**breach** (breach), *n.* *pl.* a garment worn by men, covering the legs.

**breach-ing** (breach-ing), *n.* the harness which braces round a horse's breech.

**breed** (breed), *s.* [*pl. p. bred, p. p. bred*], to procreate; hatch; train. [*EDUCATION*]

**breed** (breed), *n.* a gentle gait; a fresh, soft wind.

**Syn.** BREED, gait, blast, gust, storm, tempest, hurricane. A *breve* is gentle; a *gale* is brisk; but steady; we have *breves* in a calm sea, which keep the sails in the favorable gale.

**Ant.** Calm, lull, quiet.

**breese** (breese), *n.* a gentle gait; a fresh, soft wind.

**Breese** (breese), *n.* the lowest pass over the main chain of the Alps.

**Brigade** (brigade), *n.* a body of troops, usually of twenty-five miles south of Innsbruck.

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**brig-an-tine** (brig-an-tine), *n.* a small two-masted square-rigged vessel like a brig, except that she has no square mainmast.

**brilliant** (brilliant), *adj.* shining; illustrious; witty; clever; lively. [*CLARE*]

**brilliant** (brilliant), *s.* to grow bright; clear up; to make bright; to make cheerful.

**Brington** (brington), *n.* Formerly Brightelmston, from a personal name. A city and watering-place in Sussex, in the English channel. It is the leading seaside resort in Great Britain.

**Bright's disease** (Bright's disease), *n.* a form of kidney disease characterized by the presence of albumin in the urine.

**brill** (brill), *n.* a fish resembling the turbot; sprat.

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[illegible]

**car-cass or -case** (*kár'kas*), *n.* [pl. *carcasses* (-s)], the dead body of an animal; a corpse; the decaying remains of a bulky thing. [**BODY**.]

**car-cass-er** (*kár'kas-er*), *n.* One who hoards up for various social or business purposes; *v.* to comb or open as wool, cotton, etc., with a comb.

**car-di-an-jack-et** (*kár-di-an-ják-et*), *a.* knitted cardigan jacket.

**car-di-nal** (*kár'di-nál*), *adj.* chief; prominent; fundamental.

**car-di-nal** (*kár'di-nál*), *n.* an ecclesiastical prince, ranking in dignity next to the pope.

**car-di-nal num-bers** (*num'b-erz*), the numbers *cardinal* and *ordinal*.

**car-di-nal** (*kár'di-nál*), *n.* *cardinal*, *ordinal*, *second, third*, etc., which are called *ordinal numbers*.

**car-di-nal points** (*pointz*), north, south, east, and west.

**car-di-nal signs** (*signz*), Aries, Libra, Cancer, and Capricorn.

**car-di-nal vir-tues** (*vir-tú-z*), among the ancients, prudence, justice, temperance, and fortitude.

**car-di-nal winds** (*windz*), winds which blow from the cardinal points.

**care** (*kár*), *n.* concern; solicitude; anxiety.

**Syn.** CARE, CARESS, charge, management. Care will lead to a cure. Care is the cure of a hurt, but in the strict sense, it comprehends personal labor; it involves responsibility; management includes responsibility. A gardener has the care of a garden; a nurse has the care of children; a steward has the management of a farm. (See *anxiety*.)

**Ant.** DISCARE, neglect, recklessness.

**car-reen** (*kár-reen*), *v.* to incline on one side, as a ship.

**car-reer** (*kár-rér*), *n.* a run at full speed; general course of action in an occupation or calling.

**Syn.** CAREFUL, cautious, provident. CAREFUL, or full of care, is the general term; to be careful is to be on guard against constant danger; to be provident is to be careful in preventing straits and difficulties. The term *careful* is applied for the most part to matters not provided for, provided only to that which is future. One is careful of his money, but provident toward a time of need. [**SEE**.]

**Ant.** HEDONISM, rash, reckless.

**car-ry** (*kár-ri*), *v.* an expression of affection.

**car-ret** (*kár-rét*), *n.* a carriage (A). As used in writing, or in correcting proof, to indicate the same correction in two or more places to be added.

**car-go** (*kér-gó*), *n.* [pl. *cargoes* ('gó)], the lading or freight of a ship.

**Syn.** CARGO, Caribbee ('b-ri-bí), the Caribbees of the Caribbee islands.

**\*Caribbean** (*kár-íb-á-n*, not *kár-íb-á-n*) *See* *Caribbees*.

**car-mi-nal** (*kár-mín-ál*), *n.* an arm of the Atlantic. *See* *Caribbees*.

**car-mi-nal** (*kár-mín-ál*), *n.* the North American recidivist.

**car-mi-nal** (*kár-mín-ál*), *n.* a criminal, a representative, in which defects or peculiarities are exaggerated to a ludicrous degree.

**car-mi-nal** (*kár-mín-ál*), *n.* one who represents others in caricature.

**car-mi-nal** (*kár-mín-ál*), *n.* decay of bones, teeth, or vegetation.

**car-mi-nal** (*kár-mín-ál*), *n.* a chimble of bells diatonically tuned, and played by hand or machinery.

**car-mi-nal** (*kár-mín-ál*), *n.* a medicine, *see* *car-mi-nal*.

**car-mi-nal** (*kár-mín-ál*), *n.* a medicine which expels wind and relieves colic.

**car-mi-nal** (*kár-mín-ál*), *n.* the essential coloring principle of cochineal.

**car-nage** (*kár-náj*), *n.* slaughter; great destruction of life.

**Syn.** CARNAGE, slaughter, massacre, butchery. Carnage respects the number of dead bodies of the slain; carnage is a rather feeble and powerless enemy; slaughter respects the act of taking away life, and the circumstances of the agent; massacre respects the respect the circumstances of the objects who are the sufferers of the action; the latter three are said of human beings only; carnage is said of human beings and of animals; butchery by the savage furies who are most active in the time of bloodshed.

**car-nal** (*kár-nál*), *adj.* pertaining to the body, its passions and its appetites.

**car-nal** (*kár-nál*), *adj.* a light rose pink; flesh color.

**car-nal-er-cation** (*kár-nál-er-ká-shún*), *n.* process of eating and drinking, as a rather feeble and powerless enemy.

**car-nal-er-cation** (*kár-nál-er-ká-shún*), *n.* the season of rejoicing before Lent; merry-making; riotous excess.

**car-nal-er-cation** (*kár-nál-er-ká-shún*), *adj.* eating or feeding on flesh.

**car-ol** (*kár-ól*), *n.* a song of joy or praise, especially in church.

**Carolina** (*kár-ól-á-ná*). Name given to two states, North and South Carolina. Near the middle of the eighteenth century the British king George the third and named it Carolina in honor of his king, Charles IX. of France.

**Syn.** CAROLINA. From *Carulus*, from root of *Charles*. Danish *Caroline*; Dutch, *Carolina*; Fr., *Caroline*; Ger., *Caroline* or *Karoline*; It.,

**Caroline islands.** A great archipelago of the Pacific, discovered by Lopes de Vilallobos in 1543, and named after Charles V., emperor of Germany.

**Car-rot** (*kär-rot*), *n.* A root vegetable. **Car-rot** is the two principal articles on either side of the neck.

**carp** (*kärp*), *n.* *s.* **carp**. Fresh-water fish. [CENSURE.]

**car-pal** (*kär-päl*), *adj.* pertaining to the carpus or wrist.

★ **Carpathian** (*kär-pä-thi-an*). The range of mountains north of Hungary. The name is derived from the Greek *karpos*, meaning a ridge or a range of hills, which is explained by the Elvönor rock chain, which is explained by the Elvönor rock chain, signifying a "ridge" or "range of hills."

**car-pen-try** (*kär-pen-tri*), *n.* the art of cutting, framing and joining timber.

**car-pet** (*kär-pet*), *n.* a woven or felted fabric, used for covering floors or stairs.

★ **Carrara** (*kär-rä-rä*). A town is the province of Tuscany, Italy, famous for its marble.

**car-rat** (*kär-rät*), *n.* taken from quarry in its environs.

**car-riage** (*kär-üj*), *n.* the art of carrying or transporting articles of conveyance or carrying one's self.

*Syn.* **CARRIAGE**, gait, walk. Carriage is best used in reference to the manner of carrying the body, whether in a state of motion or rest; *post* is the mode of carrying the limbs and body over water.

**Carry**, *v.* to convey. **Carry** the body when we move forward to walk.

**Carrie, Caddie.** Feminine names corrupted from *carry*.

**car-rier** (*kär-ri-er*), *n.* one who, or that which, carries or conveys; one whose business is to carry.

**car-ry** (*kär-üj*), *v.* to convey; a variety of pigeon trained to convey letters, etc.

**car-ry-on** (*kär-ü-n*), *n.* dead or putrefying flesh; a funeral.

**car-ron-ade** (*kär-un-äd*), *n.* a short cannon of large bore for close range, formerly used in the navy.

**car-rod** (*kär-röd*), *n.* a wooden rod or lime-water used as a liniment for burns.

**car-rot** (*kär-üd*), *n.* a well-known plant with an orange-colored root.

**car-ry** (*kär-üj*), *n.* *s.* to convey from one point to another; *carry* have on one's person; *convey* by land.

**Carson City, Nev.** Named in honor of Christopher Carson, or, more widely known, "Kit" Carson.

**cart** (*kär-t*), *n.* a vehicle for conveyance of heavy goods.

**car-tel** (*kär-tel* or *kär-täl*), *n.* an agreement between two nations, the exchange of letters.

**Carthage** (*kär-thä*). From *Karthak*, the "old." A city, the opposition to Utica, "the old."

**Carthage** (*kär-thä*), *n.* an elastic animal tissue.

**car-ti-lage** (*kär-thi-lä-jen*), *n.* a cartilage pertaining to, or in the form of, cartilage; gristle.

**car-tist** (*kär-tist* or *kär-täl*), *n.* one who makes charts or maps.

**car-ti-to-graph-ic** (*kär-thi-tä-grä-fik*), *car-ti-to-graph-ic* (*kär-thi-tä-grä-fik*), *adj.* pertaining to cartography.

**car-tog-raph-er** (*kär-tä-grä-fär*), *n.* the art or business of drawing charts or maps. [Also *cartographer*.]

**car-tog-raphy** (*kär-tä-grä-fä*), *n.* the science dealing with a political or social subject.

**car-tridge** (*kär-tridj*), *n.* a case of cardboard, metal, or other material, containing a single shot.

**car-ve** (*kär-üj*), *v.* to form a design; shape by cutting; cut into slices.

**car-ven** (*kär-ün*), *adj.* carved.

**car-ven** (*kär-ün*), *n.* a figure of a woman in long robes, serving to support an entablature.

**Casco Bay, Me.** From an Italian word, meaning *case* (*kä*), *n.* a covering or receptacle; a sheath; a box with its contents.

**Catch** (*käsh*), *n.* that which happens or befalls; the matters involved in a question under discussion or investigation; a certain form or instance of disease; a case.

*Syn.* **CASE**, *cause*. The *case* is matter of fact; the *cause* is matter of question; a *case* involves direct evidence; a *cause* involves legal arguments; a *case* is something to be learned; a *cause* something to be decided. (See *cause*.)

**casement** (*kä-sä-mänt*), *n.* a window frame hinged at the side.

**cas-er-ös** (*käs-ös*), *adj.* cheerful.

**cas-er-ös** (*käs-ös*), *n.* money; ready money; *s.* *t.* to turn into, or exchange for, money. [MONEY.]

**cash-ier** (*käsh-er*), *n.* a person who keeps a register is kept of money received or paid out.

**cash-ier** (*käsh-er*), *n.* one who has charge of the money, paid out or received.

**cash-mer** (*käsh-mer*), *n.* a soft woollen fabric for shawls, etc. (originally made in Cashmere).

**cash-mer** (*käsh-mer*), *n.* a small country house; a room for putting armaments.

**cash-mer** (*käsh-mer*), *n.* composed of wooden staves, bound by iron hoops.

**cas-ket** (*käs-ket*), *n.* a small chest or box for jewels.

**Caspian** (*käs-pi-an*). The European name of the great inland sea of Asia. It was so called by the Greeks, and was the name of the time of Herodotus, dwelt on its western shore.

**casque** (*käsk*), *n.* a helmet.

**Cass** (*käs*), *n.* a daughter. A daughter of Priam.







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**cleanse** (*kleins*), *v. t.* to make clean; purify from moral impurity or guilt.

**clear** (*klér*), *adj.* bright; pure; manifest to the understanding; *v. t.* to make bright; render evident; free from obstructions.

**clear-ance** (*klér-áns*), *n.* the act of clearing; freedom from stain or dullness constitutes *clear-ance*; the return of light, and consequent removal of clouds, constitutes *clear-ance*; brightness supplies a certain strength of light; *clear-ance* is a freshness combined with the strength, and even a degree of brilliancy. [See *aperture*.]

**clear-ance** (*klér-áns*), *n.* the act of clearing.

**clear-cut** (*klér-kút*), *adj.* having a sharp, clearly defined edge as if cut with a knife.

**clear-ing** (*klér-ing*), *n.* the act of making clear; land cleared of timber.

**clear-ness** (*klér-nés*), *n.* a clear manner.

**Byn.** CLEARLY, distinctly. That is seen *clearly* of which one has a clear view independent of anything else; that is seen distinctly which is seen so as to distinguish it from other objects. We see the moon *clearly* whenever it shines; but we cannot see the spots in the moon distinctly without the help of glasses.

**clear-ness** (*klér-nés*), *n.* dimly, obscurely.

**clear-ness** (*klér-nés*), *n.* the quality of being clear.

**Byn.** CLEARNESS, perspicuity. *Clearness* respects our ideas, and springs from the distinction of things themselves (*klér-nés*); *clearness* presupposes the mode of expressing the ideas, and respects the good qualities of style.

**clear-ness** (*klér-nés*), *n.* the quality of being clear.

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fern, ást, jat, fite, écté, ánd; met, mí, hár; pin, lást; nó, ná, for, fóly; úp, úst; há, for; for, á, and, y, see Key.























































*frightful* is less than the *tremendous*; the *tremendous* than the *terrible*; the *terrible* than the *horrible*; shrieks may be *frightful*; thunder and lightning may be *tremendous*; the roaring of the lion is *terrible*; the actual spectacle of killing is *horrible* or *horrid*. We may speak of a *frightful*, *dreadful*, *terrible*, or *horrid* dream; or *frightful*, *dreadful*, or *terrible* tempest; *dreadful*, *horrible*, or *horrid* consequences.

**Ant.** COMMONPLACE, contemptible, mean, paltry.

**fear-less** (*fē'la-s*), *adj.* without fear. [BOLD.] **fear-ful** (*fē'fū-l*), *adj.* practicable.

**feast** (*fēst*), *n.* a sumptuous repast; a festival, especially of the church; a banquet; a sumptuous meal.

**feath-er** (*fēth'ēr*), *n.* part of the exterior covering of a bird; *i. e.* tuft of down of feathers; hotheadedly when leaving the water.

**feath-er weight** (*wēit*), in a handspike, the least weight that can be put on a scale.

**feath-er-y** (*-ē*), *adj.* covered with, or resembling, feathers.

**featur-ure** (*fē'chūr*), *n.* the cast of the face.

**featur-ed** (*fē'chūd*), *adj.* having a particular cast of face.

**febrile** (*fē'brīl* or *fē'brī-l*), *adj.* pertaining to, or accompanied by, fever.

**February** (*fē'brw-er-ē*), *n.* From the Latin word *februa*, to purify, because the purification of women took place in this month.

**feck-ful** (*fēk'fū-l*), *adj.* containing dregs.

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fām, dāk, fāl, fāle, cār, fām; met, mē, nē, pā, nā, nōt, nōt, fōr, only, fōr, cūp, fār, fār; fōr δ, q, and n, see Key

































**Ger.**, Heinrich; *It.*, Enrico; or *Erice*; *Lat.*, Henry; *Port.*, Henrique; *Sp.*, Enrique; *Sw.*, Henrik.

**Henry, Cape, Va.** Named by Admiral Newport in 1607. (1607). The name of a peninsula, the son of James I. of England.

**he-pai-ke** (*he-pai-ku*), *adj.*, pertaining to the liver.

**Herberich** (*he-ber-ich*), *n.*, a province of the government by seven rulers, especially the seven Anglo-Saxon kingdoms established in England.

**her-ber** (*her-ber*), *prom.*, a person who assumes care of the personal pronoun *she*.

**her-ald** (*her-ald*), *n.*, formerly an official who proclaimed messages from a sovereign; precursor: *v.*, proclaim; usher in. [ANNOUNCE.]

**her-ald-ice** (*he-rald-ice*), *adj.*, pertaining to heralds or heraldry.

**her-al-dry** (*her-al-dry*), *n.*, the science that treats of heraldic bearings.

**Her-er** (*he-er*), *n.*, Anciently *Aris-Crinias*, the town on the Arion near the river Heri.

**herb** (*erbs* or *herb*), *n.*, a plant with a soft and succulent stem.

**herbaceous** (*he-ber-shus*), *adj.*, pertaining to, of the nature of, or feeding upon, herbs.

**herbage** (*herb-aj* or *herb-aj*), *n.*, herbs collectively; grass; pasture; the right of pasture on the lands of another.

**herb-er-ium** (*he-ber-er-ium*), *n.*, [*pl.* *herbaria* (-*ia*)], a systematic collection of dried plants for purposes of study; a building where such a collection is made.

**Herbert** (*he-ber-t*), *n.*, a name derived from the German *Heribert*, *Herbert*, *Heribert*, Old German *Herbert*, which means "bright" or "illustrious lord." *Lat.*, *Herbertus*; *Sw.*, *Herbert*.

**her-bi-fer-ous** (*he-ber-fus*), *adj.*, producing herbs.

**Herbipolitanum** (*he-ber-pi-tanum*), *n.*, an ancient city of Campania, Italy, near the coast, six miles northeast of Naples, directly at the foot of Mount Vesuvius. The ancient Greek name was *Herakleion*, "city of Hercules."

**Her-cule-an** (*he-ter-ian*), *adj.*, pertaining to Hercules, the hero Greek and Roman mythology; superhuman strength; hence, of exceeding strength and power; very difficult.

**Her-ules** (*he-er-ules*), *n.*, from the Greek *Hera* and *Klous*, "glory of fame"; hence, the "glory of Hera." *Fr.*, *Herules*; *Ger.*, *Herules*; *Gr.*, *Herakles*; *It.*, *Herakles*.

**herd** (*herd*), *n.*, a collection of beasts or cattle; crowd; a keeper of cattle: *v.*, to unite or associate, as herds; crowd together; crowd together.

**here** (*air*), *adv.*, in, or to, this place or time; at this point.

**here-by** (*her*), *adv.*, by virtue of this; near.

**here-der-lary** (*her-der-lary*), *adj.*, passing from an ancestor to a descendant.

**here-dit-ary** (*her-er-dit-ary*), *n.*, the transmission of physical or mental characteristics or qualities from parent to offspring.

**here-der-er** (*her-er-er*), *adj.*, in this.

**here-in-af-ter** (*her-in-af-ter*), *adv.*, in this (deed, book, etc.) after or subsequently.

**her-e-tic** (*her-er-ic*), [*pl.* *heretics* (-*ics*)], an opinion or doctrine at variance with fundamental truths commonly received. [HETERODOXY.]

**her-e-tic** (*her-er-ic*), *n.*, one who holds, or maintains, heretical opinions.

**her-e-tic-cal** (*her-er-ic-cal*), *adj.*, pertaining to, or having the character of, heresy.

**her-e-to-fore** (*her-er-to-fore*), *adv.*, previously; hitherto.

**her-er-age** (*her-er-age*), *n.*, an estate or birthright that passes from an ancestor to a descendant.

**Herman** (*her-man*), *n.*, from the Teutonic, meaning the "leader of an army." Danish, *Hermann*; Dutch, *Herman*; French, *Armand* or *Armand*; *Gr.*, *Hermann*; *Lat.*, *Hermannus* or *Hermannus*; *Sw.*, *Herman*.

**her-maph-ro-dite** (*her-maph-ro-dite*), *adj.*, having the sexual characteristics of both male and female: *n.*, an animal with both the male and female sexual organs.

**her-met-ic** (*her-met-ic*), *adj.*, perfectly closed and air-tight. [Also *hermetic*.]

**Hermione** (*her-mi-on*), *n.*, a name derived from *Hermione*, a daughter of Mars and Venus, who married Cadmus.

**her-mit** (*her-mit*), *n.*, one who retires from society and lives in solitude; an ascetic.

**her-mit-age** (*her-mit-age*), *n.*, the abode of a hermit; a wine.

**Her-mu-sa** (*her-mu-sa*), *n.*, a palace at St. Petersburg, Russia, founded by Catherine II, originally in the form of a pavilion of moderate size, but rebuilt in the nineteenth century in a neo-Greek style of excellent effect, and forming one of the best-designed museums existing. Also the name of the home of Frederick Jackson, near Nashville, Tenn.

**her-nia** (*her-nia*), *n.*, a protrusion of some part of the stomach, or of any other internal organ, through the abdominal wall.

**he-ro** (*he-ro*), *n.*, [*pl.* *heros* (-*es*)], a man of distinguished courage, moral or physical; the chief character in a play, novel, poem, etc.

**Hero**, *n.*, female name, so called after the celebrated Greek name *Hero*, one raised or elevated.

**he-ro-ic** (*he-ro-ic*), *adj.*, having the qualities of a hero; larger than life; venturesome; drastic. [Also *heroic*.] *n.*, *pl.* extravagant or boastful language.

**her-o-ism** (*her-er-ism*), *n.*, the qualities of a hero.

**he-ro-ism** (*her-er-ism*), *n.*, the qualities of a hero.

**he-ro-ic** (*her-er-ic*), *n.*, a wading bird with a long neck and long legs.

**he-ro-wor-ship** (*her-er-wor-ship*), *n.*, excessive admiration of distinguished men.

**he-ro-ic-ism** (*her-er-ic-ism*), *n.*, that branch of zoology that treats of reptiles and amphibians.

**her-ing** (*her-ing*, not *her-in*), *n.*, an edible sea fish.

**her-ing-bone** (*her-ing-bone*), *n.*, a kind of cross-stitch: *v.*, to *her-ing-bone* is such a stitch.

**hes-i-tant** (*hes-i-tant*), *n.*, hesitation; suspense.

**hes-i-tant** (*hes-i-tant*), *v.*, to be in suspense or uncertainty.

**Hes-ti-a** (*hes-ti-a*), *n.*, a Roman goddess, sister of Jupiter, Juno, and Minerva.

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**high-bow** (*hi-bow*), *adj.*, elevated; proud; extravagant; inflated.

**high-hand-ed** (*hand-ed*), *adj.*, violent; arbitrary.

**high-land** (*hi-land*), *n.*, a mountainous region; *pl.* mountainous districts.

**High-land** (*hi-land*), *n.*, a district in northern and western Scotland, of vague limits. It includes the Hebrides, the counties of Argyll, Inverness, Ross and Cromarty, Sutherland, and Caithness, and parts of Naïro, Elgin, Banff, Aberdeen, Kincardine, Forfar, Perth, Stirling, Dumfries, and Bute.

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between the tongue and upper teeth: s. t. to utter such a sound.

**his (his)**, *interj.*, silence! hark!

**his-to-logy** (*his-tol-ō-jy*), n. the science of animal history.

**his-to-ri-an** (*his-tō-ri-ān*), n. a writer or student of history.

**his-to-ry** (*his-tō-ri*), *adj.* pertaining to, contained in, or celebrated in, history. [*Also* *Historical*.]

**his-to-ry** (*his-tō-ri*, not *his-tō-ri*), n. [*pl.* *histories*], a narrative of facts and events arranged chronologically; knowledge of facts.

**his-tri-on-ic** (*his-tō-ri-on-ik*), *adj.* pertaining to actors or the stage; theatrical. [*Also* *Historical*.]

**hit (hit)**, v. t. [*p.* *hit*, *p.* *hit*, *p.* *hit*], to p. hitting, to strike; give a blow to; touch (the mark); attain success; s. t. to clash or collide; succeed; n. a stroke or blow; felicitous remark.

**hitch (hitch)**, n. a catch; impediment; a pulling upward; s. t. to catch or seize, strike the feet together: s. t. to fasten or tie.

**hitch-er** (*hitch-er*), *adj.* to this place; add. to the ride nearest to the speaker.

**hive (hive)**, n. an artificial house for bees; bees inhabiting a hive; a busy assemblage: s. t. to gather or put into a hive.

**hives (hives)**, n. pl. nettle rash; croup.

**Hoang-Ho** (*Hoang-Ho*), n. [*Also* *Hwang-Ho*], the "yellow river," which borders Ho-Nan, the province "mouth of the river," and flows into the Hoang-Hai, or "yellow sea," so called because discolored by the yellow mud brought down by the Hoang-Ho.

**hoar (hoar)**, *adj.* white; gray with age; ancient.

**hoard (hoard)**, n. a store or treasure laid up secretly; an accumulation of things: s. t. to collect and lay up; s. t. to lay up or store.

**hoar-frost** (*hoar-frost*), n. white particles of frozen dew or moisture.

**hoar-herb** (*hoar-herb*), n. a white, woolly, aromatic herb.

**hoarse (hoarse)**, *adj.* rough and harsh in sound; as the voice when affected by a cold.

**hoax (hoax)**, n. a sportive, deceptive trick; s. t. to delude by a hoax.

**hoax (hoax)**, n. the part of a game on which things are played to be kept warm.

**hob-ble** (*hob-ble*), v. t. to walk with a limp or awkward step; s. t. to enlame or perplex; shake; n. limping or awkward step.

**hobby (hobby)**, *adj.* rough or uneven.

**hobby (hobby)**, n. [*pl.* *hobbies*], a favorite pursuit or object; an amusing game.

**hobby-horse** (*hobby-horse*), n. a stick with a horse's head, by which children stir; a wooden or rocking-horse.

**hob-gob-lin** (*hob-gob-lin*), n. a goblin, spirit, or elf, who secretly does mischief.

**hob-nail** (*hob-nail*), n. a short thick nail with a large head.

**hob-nail** (*hob-nail*), v. t. to drink familiarly with; associate intimately together.

**hob-nail** (*hob-nail*), n. an idle itinerant workman; a tramp.

**Hoboken** (*Hoboken*), n. In New Jersey, opposite New York, often said to be a native name meaning "the smoked pipe," marking the spot where the first colonists smoked the pipe of peace with the Indian chiefs. It is more likely, however, a reminiscence of the Dutch village of *Hoboken*, three miles from Antwerp.

**hock-ey** (*hock-ey*), n. an outdoor game played with a ball and clubs curved at one end.

**hock-ey** (*hock-ey*), n. a juggler's trick; a juggler.

**hock (hock)**, n. a wooden trough, affixed to a handle, for carrying mortar, bricks, etc.

**hock-carrier** (*hock-carrier*), n. a man who carries a hock.

**hodge-podge** (*hodge-podge*), n. a medley of ingredients.

**hock-man** (*hock-man*), n. a hockcarrier.

**hock (hock)**, n. an agricultural contrivance for cutting weeds, etc.; s. t. to cut, or till, with a hoe.

**hock (hock)**, n. a swine; a grasping, gluttonous person.

**hock-head** (*hock-head*), n. a measure of capacity equal to 32½ imperial gals. of wine cask, a large barrel or cask.

**Hockholsten** (*Hockholsten*), n. a castle, a castle situated in the Swabian Alps, near Hechingen, southern Germany, belonging to the present Hohenzollern royal family. It is the ancestral home of Emperor Wilhelm II. of Germany.

the latter signifies keeping a long time for one's own purpose.

**hold** (*hold*), *verb*, let loose, release.

**hold-ing** (*hold-ing*), n. anything held; tenure or possession.

**hole (hole)**, n. a cavity; hollow place; pit; perforation; a difficulty or dilemma.

**hole (hole)**, n. a day of gayety and joy in celebration of some event, etc.; *adj.* pertaining to a festival; joyous; gay.

**hole-in-the-head** (*hole-in-the-head*), n. the state or quality of being holy; freedom from sin; sacredness; a title of the pope.

**HOLLAND**, *adjective*, *Hollands*, n. to the mind of a man what sanctity is to his exterior; with this difference, that whereas to a certain degree of holiness is necessary to professing Christianity, but sanctity, as it lies in the manner, the outward garb, and deportment, is becoming only to certain persons and at certain times.

**HOLLAND** (*hol-lan-d*), n. fine unbleached linen.

**Holland**, a kingdom of western Europe. Name supposed to be derived from *holland*, or *holland*, "marshy ground." Taylor gives the translation of *holland* as "woodland," that is, the forest and Downland.

**hol-lee** (*hol-lee*), v. t. to about to one at a distance: n. a about.

**hol-low** (*hol-low*), *adj.* having a void space within; opposed to solid; insincere; superficial: n. a cavity; space between hills or elevations: s. t. to make hollow on any account; to deceive; to humiliate.

**syn.** *HOLLOW*, empty. *Hollow*, a cavity formed by taking material out; as, a hollow tree. It has nothing in it; it is empty; as, an empty chair.

**hol-ly** (*hol-ly*), n. a shrub or tree of the genus *Ilex* (*hol-ly*), n. a tall plant of the Malvaceae family.

**hol-ly** (*hol-ly*), n. a sacrifice wholly consumed by fire.

**hol-ly** (*hol-ly*), n. a leather pistol case usually carried at the saddle bow.

**HOLY**, *adjective*, *holiest*, *superlative*, pure; morally and spiritually perfect; sinless; pious; sacred; consecrated.

**HOLY**, *adjective*, *holiest*, *superlative*, devoted, divine, hallowed, sacred, saintly, set apart. *Sacred* is applied to that which is to be regarded as inviolable on any account; that which is *holy* is so by its own nature, possessing intrinsic moral purity, and, in the highest sense, absolute moral perfection.

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**hon-ey** (*hon-ey*), n. a sweet sirupy substance collected by bees; sweetness; *adj.* resembling honey; s. t. to be as sweet as honey; to be in a flattering manner.

**hon-ey-bee** (*hon-ey-bee*), n. the common bee-hive.

**hon-ey-comb** (*hon-ey-comb*), n. the waxen hexagonal cells made by bees for storing honey, eggs, etc.; any structure resembling a honeycomb; s. t. to fill with holes.

**hon-ey-dew** (*hon-ey-dew*), n. a saccharine secretion from the leaves of certain plants.

**hon-ey-moon** (*hon-ey-moon*), n. the first month after marriage.

**hon-ey-suckle** (*hon-ey-suckle*), n. a climbing plant with fragrant flowers.

**HONGKONG**, n. Island of coast of China.

**hon-est** (*hon-est*), n. respectful regard; esteem; worship; respectful name; esteem; ad. to be in the manner of high esteem; a title; one of the four highest trump cards in whist; s. t. to treat with respect, deference, or civility; bestow marks of honor upon (with *wh*); accept; and pay when due.

**HONOR**, *adjective*, *reverence*, respect. *For* *honor* is either an act of the mind or the outward expression of a sentiment; it is mostly an act of the mind, though it may admit of being expressed by some outward act. *We honor* God by adoration and worship; *we honor* our parents by obeying them; *we honor* a person by giving him the title of honor; *we honor* a person by cherishing in our minds a dread of offending him; *we respect* a person or thing that is worthy of respect; *we admire* a person or thing that is worthy of admiration. [*See* *HONOR*.]

**HONORA**, an Irish female name derived from the Latin name *Honor*.

**hon-er-able** (*hon-er-able*), *adj.* worthy of, or conferring, honor; distinguishable in rank; a title of distinction.

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signifying "he shall add." Fr. *Joseph*; Ger. *Joseph*; Hungarian, *Josaf*; It. *Giuseppe*; Lat. *Josephus* or *Joseph*; Polish, *Josif*; Port. *José*; Sp. *José*.

**Josephine** (*yô-sê-in*). The feminine of *Joseph*. Fr. *Josephine*; Ger. *Josephine*; It. *Giuseppina* or *Giuseppina*; Lat. *Josephina*.

**Joshua** (*yôsh-u*). From the Hebrew *Yôshua*, "whom he helps," hence "savior." Dutch, *Josua*; Fr. *Josué*; Ger. *Josua*; It. *Josue*; Lat. *Josua*; Sw. *Josua*.

**Joshab** (*yô-shâb*). Of *Jôshab* (*yô-shâb*). From the Hebrew *Yôshabab*, "whom the Lord gives." Dutch, *Josaba*; Fr. *Josaba*; Ger. *Josaba*; It. *Josaba*; Lat. *Josaba*.

**Josiah** (*yô-shi-ah*). A Chinese god or idol.

**Josie** (*yô-shi*). A. to push against; elbow.

**Jot** (*yô*). A. to push against; elbow.

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**Julian** (*yû-li-an*). adj. pertaining to *Julius Caesar*, or to the *Julian calendar* as adjusted by *Julius Caesar* 46 B.C.

**Juliana** (*yû-li-ân*). A feminine name derived from the Latin *Julianus*, formed from *Julius*. *Juliana* is a feminine as well as a masculine name. Dutch, *Juliana*; Fr. *Julienne*; Ger. *Juliana*; It. *Giuliana*; Lat. *Juliana*; Port. *Juliana*; Sp. *Juliana* or *Juliano*; Sw. *Juliana*.

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**Julienne**. See *Julia*.

**Juliet** (*yû-li-ét*). A diminutive formed from *Julia*. *Juliet* is a feminine name. Dutch, *Julia*; Fr. *Julia*; Ger. *Julia*; It. *Giulia*; Lat. *Julia*; Port. *Julia*; Sp. *Julia*; Sw. *Julia*.

**July** (*yû*). The seventh month of the modern calendar; so named by *Marco Antonio* in honor of *Julius Caesar*, who was born in it.

**Jun-ble** (*yûn-blé*). A. a confused mass: v. to mix without order: s. to mix.

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ing "otter-laid"; "beautiful water" and "boiling water" are other versions.

**Kale** (*kâ*). A. a cabbage with open curled leaves; sea kale.

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form, ask, fol, fâs, edre, anal; met, m, h; pin, lin, not, nâs, fôr, only, fôs, esp, fôr, for, o, g, and key.

K

**Kaaba** (*kâ-â-â*). A. a cube-shaped building in the center of the Great Mosque at Mecca, where the Mohammedans worship.

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in the West Indies: *s. t.* to place and abandon on a desert island; *s. t.* a brownish-crimson color.

**mar-quis** (már'kwis), *n.* a nobleman ranking next below a duke; *(also)* regulate, *mar-quis* *v.*

**mar-riage** (már'j), *n.* the act of legally uniting a man and woman in wedlock; marriage ceremony, marriage vows, *(also)* civil union; *s. t.* to fill the cavities of bones; the essence of anything.

**mar-ry** (már'j), *v. t.* to unite as husband and wife; *(also)* *s. t.* to enter into wedlock.

**marsh** (már'sh), *n.* a swampy tract of land.

**mar-shal** (már'shál), *n.* an official of high rank who superintends and regulates all ceremonies.

**mar-t** (már't), *n.* a market; purchases and sales.

**Martha** (már'thá), *n.* *Latin* derives this name from a Syriac word signifying "lady."

**Martha** (már'thá), *n.* *Dutch*, *Martha*; *Fr.* *Marthe*; *Ger.* *Martha*; *It.* *Marta*; *Lat.* *Martha*; *Sp.* *Martha*; *Sc.* *Martha*.

**Martha's Vineyard** (már'thá's vín'yard), *n.* a small island in Buzzards Bay, Massachusetts.

**Mar-tin** (már'tín), *n.* one of several species of birds allied to the swallow.

**Martin** (már'tín), *n.* From the Latin name, *Martinus*; from *Martinus*; from *Mars*, "warlike."

**Martin** (már'tín), *n.* *Dutch*, *Martina*; *Fr.* *Martin*; *Ger.* *Martin*; *It.* *Martino*; *Lat.* *Martinus*; *Sp.* *Martin*; *Sc.* *Martin*.

**Martines** (már'tín's), *n.* Spanish, meaning "the son of Martin."

**mar-in-ale** (már'in-ál), *n.* a broad strap passing from the nose-band to the girth of a horse, between the fore legs, to which is fastened a lower strap for the bit-bow or flying bit-bow.

**Martinsburg** (már'tín'sbúrg), *n.* a town in Berkeley county, West Virginia, named for Col. "Tom" Martin, of militia in the War of 1812.

**mar-tyr** (már'tír), *n.* one who testifies by his death to his faith or principle; *s. t.* to put to death for adherence to some belief.

**mar-tyr-dom** (már'tír-dóm), *n.* the death or sufferings of martyr.

**mar-vel** (már'vél), *n.* something extraordinary and astonishing; a prodigy; *s. t.* to be struck with astonishment; *understand*, *mar-vel* *v.*

**mar-vel-ous** (már'vél-ús), *adj.* exciting wonder; incredible.

**Mary** (már'y), *n.* From the Hebrew, meaning "latter."

**Mary** (már'y), *n.* *Hebrew*, *Mary*; *Fr.* *Maria*; *Ger.* *Maria*; *It.* *Maria*; *Lat.* *Maria*; *Polish*, *Maria*; *Port.* *Maria*; *Sp.* *Maria*; *Sc.* *Maria*.

**Maryland** (már'y-lánd), *n.* One of the South-Atlantic states of the United States. It was intended that the country granted by the charter to Lord Baltimore, in his patent to Lord Baltimore, June 30, 1632, should be called *Crescentia*, but when presented to the king for signature, in conformity to his wishes, the name of the province was changed to that of *Terra Maria*, "Mary's land," in honor of his queen, Henrietta Maria, daughter of Henry IV. of France.

**mar-vel** (már'vél), *n.* a person or thing that brings good fortune.

**mar-vel-ous** (már'vél-ús), *adj.* pertaining to having the qualities of, or suitable for, a man; manly.

**mar-sh** (már'sh), *n.* a soft or pulpy mass; a mixture of hen and water for horses; *s. t.* to mix with hot water (as meat) in brewing.

**mar-sh** (már'sh), *n.* one who imperceptibly endeavors to make himself attractive to, or engage the attention of, women.

**mask** (másk), *n.* a covering or partial cover to conceal the face; pretext or subterfuge; a masquerade; *s. t.* to conceal with, or as with, a mask. [PRE-TERITE.]

**mas-on** (má'són), *n.* a builder in stone; a Freemason.

**mas-on-ic** (má'són-ik), *adj.* pertaining to Freemasons or to their art.

**mas-quer-a-de** (má'skér-ád), *n.* a ball or festive gathering where masks are worn; a disguise; *s. t.* to cover with a mask or disguise; *s. t.* to take part in a masquerade.

**mass** (má's), *n.* a large quantity; lump; the celebration of the Eucharist in the Roman Catholic church; pl. common people.

**Massachusetts** (má'sáshúts), *n.* an Indian word, *Massawut*, contraction of *mass*, "great" and *wut*, "mountain," *s. t.* "near," "the place of the great hills" (reference to the Blue Hills). One of the New England states.

**mas-sa-cre** (má'sákr), *n.* indiscriminate slaughter with unmerciful cruelty; *s. t.* to slaughter indiscriminately. [CARNAGE.]

**mas-sage** (má'sáj or má'sáj), *n.* a method of medical treatment by rubbing or kneading the body.

**mas-sa-ge** (má'sáj), *n.* one who performs the operation of massage. (Fem. *massa-ge*). [French.]

**mas-sive** (má'sív), *adj.* weighty; heavy; bulky; imperfectly and irregularly crystallized.

**mas't** (má'st), *n.* a long round piece of timber or iron tube, raised vertically on the keel of a vessel to support the sails.

**mas'ter** (má'stér), *n.* one who rules or commands others; director; *adj.* pertaining to a master; chief; *s. t.* to subdue or overcome; *s. t.* to excel.

**mas'try** (má'stér-í), *n.* dominion; preeminence; eminent skill.

**mas'til-ate** (má'stíl-át), *v. t.* to grind with the mill.

**mas'til-ous** (má'stíl-ús), *n.* a large variety of dog.

**mas'ti-fen** (má'stí-fén), *n.* an extinct genus of insects.

**mas'tur-ba-tion** (má'stúr-bá-shún), *n.* self-pollution.

**mas'tur-bate** (má'stúr-bá-té), *v. t.* to cover with mucus; entangle or interweave.

**Matanzas** (má'tón-sá), *n.* Spanish *matón* (má'tón), *n.* a French name for a Spanish name, "sacred," applied by Menéndez to commemorate his destruction of Ribault and his followers.

**match** (másh), *n.* anything that readily ignites; a lighter; anything which agrees with or suits another thing; *s. t.* to be equal to.

**match-mak-er** (másh-mák-ér), *n.* one who seeks to arrange marriages.

**mate** (má't), *n.* a companion or associate; an equal; the male and female of animals associated for propagation; checkmate; *s. t.* to match; to be equal to; marry.

**mat-er** (má'tér), *n.* *adj.* consisting of matter; not spiritual; essential; *n.* the substance of which anything is made. [PHYSICAL.]

**mat-er-ial** (má'tér-í-ál), *n.* *adj.* pertaining to all spiritual phenomena are the result of organized matter.

**mat-er-ial-ize** (má'tér-í-ál-íz), *v. t.* to invest with material characteristics.

**mat-er-nal** (má'tér-nál), *adj.* motherly.

**mat-er-nal-ism** (má'tér-nál-íz-m), *n.* the character or relationship of a mother.

**mat-h** (másh), *n.* *adj.* pertaining to mathematics; theoretically precise. [Also mathematic.]

**mat-h** (másh), *n.* the science of number and quantity.

**Matilde** (má'tíld), *n.* A French form of *Matilda*.

**Matilda** (má'tíld), *n.* *Fr.* *Matilda*; *Lat.* *Matilda*; *Dutch*, *Matilda*; *Fr.* *Matilda*; *It.* *Matilda*; *Lat.* *Matilda*; *Sp.* *Matilda*; *Sc.* *Matilda*.

**Matilda** (má'tíld), *n.* *adj.* pertaining to the morning or to matins.

**mat-ri-ice** (má'trí-ís), *n.* a reception or reception of dramatic performance held in the daytime.

**mat-ri-ice** (má'trí-ís), *n.* the murder of a mother by one of her children.

**mat-ri-ice** (má'trí-ís), *n.* *adj.* to admit to the membership of a college or university by entering a letter.

**mat-ri-ice** (má'trí-ís), *n.* *adj.* pertaining to marriage; nuptial; conjugal.

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**mat-ri-ice** (má'trí-ís), *n.* *adj.* pertaining to marriage; nuptial; conjugal.

from *Fr.* *du marais*, "from the marsh."

**Matthias** (má'thí-ás), *n.* *Dutch*, *Matthias*; *Fr.* *Matthias*; *Ger.* *Matthias*; *It.* *Matthias*; *Lat.* *Matthias*; *Sp.* *Matthias*; *Sc.* *Matthias*.

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mixture—morbid

several things; we mingle several objects; things are mixed so as to lose all distinction; but they may be mingled and yet retain a distinction; to blend is only partially to mix, as colors blend which fall into each other; to confound is to mix in a wrong way, as objects of sight are confounded when they are erroneously taken to be joined.

**mix-ture** (miks'tūr), *n.* the state of being mixed; a compound or mass formed by mixing.

**mnemonics** (nā-mōn'iks), n. pl. the art or science of assisting the memory.

farm, dak, fol, fole, core, final

mat, mē, hār; pin, line; not, note, fār, only, fōg; cup, gas, fūr; for θ, φ, and x, see Key.













[illegible][illegible]

ti-mism (*'ti-mi-m*), *n.* the doctrine that everything in the present state of existence is for the  
 op-timist (*'ti-mi-ist*), *n.* one who holds the doctrine of optimism.  
 op-timism (*'ti-mi-zm*), *n.* the right of choice; wish; selecting. [ALTERNATIVE.]  
 op-u-lence (*'u-lens*), *n.* wealth.  
 op-u-lent (*'u-lent*), *adj.* wealthy; rich.  
 or (*dr*), *conj.* the copulative of *and*.  
 or-a-cle (*'o-r-ä-kl*), *n.* among the ancients, the response of a deity to human questions by means of oracles; testing; divination.  
 or-a-ty (*'o-r-ä-ti*), *n.* prayer.  
 or-a-ty-n-ary (*'o-r-ä-ti-n-ä-ry*), *adj.* of the nature of an oracle; uttering oracles; dogmatically magisterial.  
 or-ange (*'r-ä-ŋ*), *adj.* verbal.  
 or-age (*'dr-ä-ŋ*), *s.* a tree (*Citrus aurantium*) with orange fruit.  
 Orange Free State. Formerly a republic of South Africa, so called because the original settlers were of the Orange River, a tributary of the Orange in Holland. Now called Orange River Colony.  
 Orange-men (*'dr-ä-ŋ-men*), Irish Protestants. The name was given to the Irish Catholics of Orange by Roman Catholics to the Protestants of Ireland, on account of their support of the Orange Society.  
 or-a-tion (*'o-r-ä-shun*), *n.* a formal public speech delivered on an occasion of special importance.  
 or-a-tor (*'o-r-ä-tör*), *n.* one who makes an oration; an eloquent speaker.  
 or-a-to-ry (*'o-r-ä-tör-i*), *n.* a musical composition for voice and instruments.  
 or-a-to-ry (*'u-d-r-ä*), *n.* the art of an orator.  
 or-b-ly (*'ä-r-ä*), *adv.* in a circle; circularly.  
 or-bis (*'b-ä*), *n.* a circular body; sphere; the earth; circuit.  
 or-bit (*'b-ä*), *n.* the bony cavity of the eye; the path described by a heavenly body during its periodical revolution.  
 or-chard (*'ch-ä-rd*), *n.* an inclosure of fruit trees.  
 or-der (*'dr*), *n.* in a modern theater, etc., the place occupied by the orchestra of a body of musicians.  
 or-der-ment (*'dr-ä-shun*), *n.* musical arrangement or instrumentation for an orchestra.  
 or-child (*'l-ä-d*), *n.* a handsome fellow, often of a military or naval officer.  
 or-dain (*'d-ä-n*), *s.* to appoint; institute; invest with ministerial or priestly functions.  
 or-din-ance (*'dr-ä-n-äns*), *n.* an ancient method of trial by fire, water, combat, etc., to determine the guilt or innocence of an accused person;  
 or-de-ry (*'dr*), *n.* method or regular arrangement; settled mode of procedure; rule; regulation; arrangement; system; order; regulation; organization or manage; command; conduct; direct; *s.* to give a command or order. [CLANS, COMMAND, ORDER.]  
 or-din-ary (*'dr-ä-n-ä-ry*), *adj.* ordinary.  
 or-din-ary (*'dr-ä-n-ä-ry*), *n.* soldier who attends upon an officer to carry his orders; *adj.* methodically.  
 or-din-ary (*'dr-ä-n-ä-ry*), *n.* a number noting order.  
 or-din-ary (*'dr-ä-n-ä-ry*), *n.* an established rule, title, or rank.  
 or-din-ary (*'dr-ä-n-ä-ry*), *adj.* according to established custom; customary; commonplace.  
 or-din-ary (*'dr-ä-n-ä-ry*), *n.* a curve in a curve terminated on both sides by the curve and bisected by a line.  
 or-din-ation (*'dr-ä-n-ä-shun*), *n.* the act of conferring holy orders, the state of being ordained or appointed.  
 or-din-ation (*'dr-ä-n-ä-shun*), *n.* the act of conferring holy orders, the state of being ordained or appointed.  
 ore (*'dr*), *n.* metal as extracted from the earth in its natural state or combined with some other  
 Oregon (*'ör-i-gon*), State of the Union, and county in Missouri. The name said to have been given by the Indians to the Indians who were found along the coast in the state, but another authority states that it is derived from the Spanish word *ore*, meaning gold, because the Indians were inhabiting that region by a Jesuit priest, the word meaning "cup-shaped mine."  
 or-gan (*'g-än*), *n.* an instrument; that part of a living structure by means of which some function is discharged; a wind musical instrument.  
 or-gan-ic (*'g-än-i-k*), *adj.* organic; composed of, containing, or produced by, organs; instrumental. [Also organical.]  
 or-gan-ism (*'g-än-i-zm*), *n.* an organismal structure.  
 or-gan-ist (*'g-än-i-ist*), *n.* a performer on the organ.  
 or-gan-ize (*'g-än-i-z*), *s.* to arrange or distribute in organs; to organize.  
 or-gan-ize (*'g-än-i-z*), *adj.* organized.  
 or-gan-ize (*'g-än-i-z*), *n.* a drunken revel.  
 or-gan-ize (*'g-än-i-z*), *n.* a large organ in a window.  
 or-gan-ize (*'g-än-i-z*), *n.* to define the position of with reference to the East.  
 or-gan-ize (*'g-än-i-z*), *n.* the East.  
 or-gan-ize (*'g-än-i-z*), *n.* one who is skilled in Oriental languages, subjects, etc.  
 or-gan-ize (*'g-än-i-z*), *n.* the determination of the position of the east; eastward position.  
 or-gan-ize (*'g-än-i-z*), *n.* a mouth or aperture.  
 or-gan-ize (*'g-än-i-z*), *n.* the terms are used in both scientifically employed to designate certain cavities in the human body; but the former is used in a general sense, and the latter in a specific; all the vessels of the human body have their *organs*, which are so constructed as to carry out the functions of the organs. The organs are frequently obliged to make *perforations* into the bone



[illegible][illegible]























**re-frig-er-ate** (*ri-frī-jē-d*), *v. t.* to cool, or keep cool, as by a refrigerator.

**re-frig-er-ate-for** (*ri-frī-jē-d*), *n.* an apparatus or vessel for preserving or cooling things.

**re-frig-er-ate** (*ri-frī-jē-d*), *n.* protection from danger or distress; shelter or asylum; stronghold.

**re-frig-er-ate** (*ri-frī-jē-d*), *n.* a place of refuge or protection, especially from political or religious persecution.

**re-ful-ent** (*ri-fu-lēnt*), *adj.* emitting a bright light; brilliant; splendid.

**re-fund** (*rē-fund*), *v. t.* to pay back again.

**re-fuse** (*rē-fu-s*), *n.* the act of refusing; rejecting; right to take the preference; option.

**re-fuse** (*rē-fu-s*), *v. t.* to deny or reject, as a demand or request; *v. i.* to decline to accept; not to comply; *n.* refusal, waste or worthless matter.

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**rein** (*rēn*), *n.* the strap of a bridle; an instrument for curbing, restraining, or governing; power.

**rein-deer** (*dēr*), *n.* a large arctic deer, the reindeer.

**rein-force** (*rēn-fōrs*), *v. t.* to supply with new strength, support, or assistance. [Also *reinforce*.]

**rein-in** (*rēn-in*), *v. t.* to restrain or curb.

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**re-mis** (*rē-mis*), *adj.* careless in the performance of duty or business; heedless; dilatory.

**re-mis-sion** (*mish-an*), *n.* the act of remitting; pardon.

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**un-ion jack** (un'yon'jak), the national flag of Great Britain.

**un-nip** (un'ni-p), adj. one-footed.

**un-nique** (un'ni-ek), adj. without another of the same kind. [RARE.]

**un-ni-sou** (un'ni-sou), n. accordance of sound; concord; harmony.

**un-ni-sou** (un'ni-sou), n. one; a single person or thing; [rare.]

**un-ni-sou** (un'ni-sou), n. one who denies the doctrine of the Holy Trinity, regarding the Godhead as unipersonal; [rare.]

**un-nite** (un'ni-t), v. t. to incorporate into one; join by a legal or moral bond; s. t. to become one; combine. [CONJECT.]

**un-ni-ty** (un'ni-ti), n. the state of being one; concord; uniformity.

**un-ni-ty** (un'ni-ti), adj. all-pervading; embracing or comprehending the whole; general. [GENERAL.]

**un-ni-ty** (un'ni-ti), n. the doctrine that all mankind will ultimately be saved.

**un-ni-ty** (un'ni-ti), n. the whole system of created things; world.

**un-ni-ty** (un'ni-ti), n. pl. universities (un'ni-ti), as assemblies of colleges.

**un-ni-ty** (un'ni-ti), adj. uncombed; rough.

**un-ni-ty** (un'ni-ti), n. the quality or act of being unkind. [ACQUINONY.]

**un-ni-ty** (un'ni-ti), adj. not educated. [IGNORANT.]

**un-ni-ty** (un'ni-ti), conj. except; if not.

**un-ni-ty** (un'ni-ti), conj. UNLESS, except. Unless, which is equivalent to if, then, if not, or if not, is employed only for the particular case; but it has always a reference to some general rule, of which an exception is hereby signified; I shall not do it unless he asks me; no one can enter except those who are supplied with tickets.

**un-ni-ty** (un'ni-ti), adj. untaught. [IGNORANT.]

**un-ni-ty** (un'ni-ti), adj. dissimilar. [DIFFERENT.]

**un-ni-ty** (un'ni-ti), adj. not limited.

**un-ni-ty** (un'ni-ti), adj. not merciful.

**un-ni-ty** (un'ni-ti), adj. being without principle. [ABSENT.]

**un-ni-ty** (un'ni-ti), adj. not qualified.

**un-ni-ty** (un'ni-ti), adj. not reasonable.

**un-ni-ty** (un'ni-ti), adj. not reasonable. [ABSURD.]

**un-ni-ty** (un'ni-ti), adj. not relenting.

**un-ni-ty** (un'ni-ti), adj. disregarding restraint or authority; turbulent.

**un-ni-ty** (un'ni-ti), v. t. to deprive of the characteristic qualities of sex.

**un-ni-ty** (un'ni-ti), adj. unutterable; that which cannot be uttered or expressed.

**un-ni-ty** (un'ni-ti), adj. UNFEEABLE, ineffable, unutterable, inexpressible. The unutterable is said of objects too sublime, particular, or too numerous to be human conception, and surpasses the power of language to describe, as the unutterable goodness of God; ineffable is said of objects as cannot be related in words with adequate force; as the ineffable sweetness of a person's look; unutterable and inexpressible are extended to things to which is incommunicable by signs from one being to another; thus grief is unutterable which is not in the power of the sufferer by any sounds to bring home to the feelings of another; grief is inexpressible which is not to be expressed by looks, or words, or any sign.

**un-ni-ty** (un'ni-ti), n. a famous street in Berlin which extends from the Brandenburg gate eastward about three-fifths of a mile. Bordered by are the imperial and princely palaces, the university, the academy, the statue of Frederick the Great, etc. Literally under the lindens.

**un-ni-ty** (un'ni-ti), prep. to.

**un-ni-ty** (un'ni-ti), n. the quality of being untrue.

**un-ni-ty** (un'ni-ti), adj. inexpressible. [UNFEEABLE.]

**un-ni-ty** (un'ni-ti), adj. not worthy.

**un-ni-ty** (un'ni-ti), adj. unworthy. Unworthy is a term of less reproach than worthless; for the former signifies not to be worthy of praise or honor; the latter signifies to be without all worth, and consequently in the fullest sense bad. There are many unworthy members in every religious community; but every society's aim is conducted upon proper principles will take care to exclude worthless members.

**un-ni-ty** (un'ni-ti), adj. worthy, valuable.

**un-ni-ty** (un'ni-ti), prep. on; above the horizon; from a lower to a higher position.

**un-ni-ty** (un'ni-ti), v. t. to reproach. [BLAME.]

**un-ni-ty** (un'ni-ti), adj. directed upward.

**un-ni-ty** (un'ni-ti), v. t. to lift up from beneath.

**un-ni-ty** (un'ni-ti), v. t. to hold up.

**un-ni-ty** (un'ni-ti), n. one who provides and places curtains, carpets, etc.

**un-ni-ty** (un'ni-ti), n. the business of an upholsterer; articles of house furnishing.

**un-ni-ty** (un'ni-ti), prep. on; resting on the top or surface; related to; not assuming; security; or time.

**un-ni-ty** (un'ni-ti), adj. higher in place, rank, or dignity.

**un-ni-ty** (un'ni-ti), adj. arrogant; assuming.

**un-ni-ty** (un'ni-ti), adj. erect; just; honest; timber supporting a raft.

**un-ni-ty** (un'ni-ti), n. a noisy disturbance; bustle and clamor. [BUSTLE.]

**un-ni-ty** (un'ni-ti), v. t. to overthrow; put out of normal position; (2) the act of upsetting; state of being upset; adj. fixed.

**un-ni-ty** (un'ni-ti), n. final result.

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V

**vac-ant** (vak'an-t), n. a state of being vacant or empty; unoccupied; open or unoccupied space.

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**vac**

**val-er-ous** (val'ē-rus), *adj.* brave.  
**val-u-able** (vā-lū-ā-bul), *adj.* possessing useful qualities; having value or worth: a thing of value.  
**val-ue** (vū), *n.* that which renders something useful or estimable; price: *v.* to estimate the worth of; *vt.* to value.

**VALU**. **VALUE**. *price, esteem.* To value is to set any value, real or supposed, relative or absolute, on a thing; in this sense men value gold above silver, or an appraiser values goods. *Value and esteem* are taken only as mental actions; the former in reference to sensible or moral objects, the latter only to moral objects; we may value and esteem according to their merits, or we may value them according to their contents; we prize books more for their contents, in which sense *price* is a much stronger term than *value*.

**ANTH.** **THINK LIGHTLY OF**.  
**VAL**. *val*, *n.* a lid or cover opening in one direction and shutting in another.  
**VAL-MORE** (vā-mōr'), *s. i.* to decamp.  
**VAMP** (vamp), *n.* the upper leather of a boot or shoe: *v.* to furnish with an upper leather.

**VAN-PIRE** (van'pīr), *n.* a faded dream or ghost that shows the blood of persons alive.

**VAN** (vān), *n.* the front of an army or fleet; a large covered wagon for moving.

**VANCOUVER** (van-kō-vēr'), *n.* a rising city which forms the western terminus of the Canadian Pacific railway, bears the name of Captain George Vancouver, B. N., who, in a military expedition, coasted the coast in 1792, and surveyed it in 1792.

**VANCOUVER ISLAND**, named in memory of Captain Vancouver, a British naval officer, who, while he was on his discovery in 1792, while cruising about in search of a river on the west coast of North America.

**VAN-DAM** (van'dām), *n.* one who ruthlessly destroys.

**VANE** (vān), *n.* a weathercock.  
**VANGUARD** (van'gārd), *n.* the advance guard of an army.

**VAN-IL-LA** (vā-nī-lā), *n.* the dried fruit of an orchid, used for flavoring.

**VAN-ISH** (van'ish), *v. i.* to disappear. [DISAP-PEAR.]

**VAN-ITY** (vā-nī), *n.* [pl. vanities (-itē)], love of indiscriminate admiration; empty pride or conceit; idle show; emptiness. [PRIDE.]

**VAN-QUISH** (van'kwish), *not van'kwish*, *v. t.* to conquer; subdue.

**VAN-TAGE** (vān'tāj), *n.* advantage; in lawn tennis, the point after a break.

**VAPOR** (vā'pōr), *n.* steam; mist; *s. i.* to pass off in vapor; boil.

**VAPOR-IZE** (vā'pōr-īz), *v. t.* to convert into vapor.

**VAPOR-OUS** (vā'pōr-ūs), *adj.* full of, or like, vapor; unreal.

**VAPOR-ABLE** (vā'pōr-ā-bul), *adj.* changeable; inconstant; fickle.

**VAP-OR-IOUS** (vā'pōr-ūs), *n.* difference; quarrel.

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**VAN-T** (vān't), *n.* a boat; *s. i.* to brag of; display boastfully; *n.* a boast. [GLORY.]

**VEAL** (vī), *n.* calf's flesh.

**VEAL** (vī), *n.* a directive quantity, as a straight line [force, of velocity].

**VE-DA** (vī-dā), *n.* [pl. Vedas (-dā)], one of the four sacred books or collection of hymns of the Hindus.

**VEER** (vīr'), *v. t.* to change direction, as the wind; wear: *v. i.* to turn; direct to a different course.

**VEGETABLE** (vī-jē-tā-bul), *adj.* pertaining to, having the nature of, produced by, or consisting of, plants: *n.* a plant; food cultivated for the table.

**VEGETABLE** (vī-jē-tā-bul), *n.* a plant; food cultivated for the table.

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**VALUOUS** (vā-lū-ūs), *adj.* green; inexperienced.

**VER-DICT** (vēr'dīkt), *n.* the finding of a jury on a trial.

**VER-DIG-GRASS** (vēr'dī-grās), *n.* the blue-green substance which grows on copper and brass as a pigment.

**VER-DURE** (vēr'dūr), *n.* greenness of vegetation.

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**rule log** (*rûl' log*), a large block of wood formerly put upon the hearth on Christmas eve to form the basis of the Christmas fire.

**rule-tide** (*rûl*), *n.* Christmas-tide.

**Yuste** (*yûs'tê*). A convent in Spain, east of Plasencia. It is noted as the place of retirement of the Emperor Charles V. after his abdication.

## Z

**Zacharias** (*zâk'z'as*). From the Hebrew *Zakhar*, "pure," "innocent." Others render it "pure of the Lord," making the last letter stand for Yah. Fr. *Zacharie*; It. *Zacche*; Lat. *Zacharias*.

**Zachariah** (*zâk'z'ar-ih*). From the Hebrew *Zakhar-Yah*, meaning "remembering the Lord." Danish, *Zacharias*; Dutch, *Zacharias*; Fr. *Zacharie*; Ger. *Zacharias*; It. *Zaccaria*; Lat. *Zacharias*; Sp. *Zacharias*; Sw. *Zacharias*.

**Zachary** (*zâk'z'ar-ih*). Same derivation as *Zachariah*.

**Zadok** (*zâd'ok*). Means "righteous." Fr. *Zodoc*; Lat. *Zadocus*.

**Zambesi** (*zâmb'ê-si*, pop., *zâmb'ê-s'ni*). Is the "great river" of eastern Africa, whose upper waters and chief affluents are called *Zambesi* and *Zuambesi*, dialectic forms of the same name.

**Zanesville** (*zân's'vîl*). City in Ohio, named for Ebenezer Zane, who, with John McIntire, founded the city.

**Zan-by** (*zân'by*), *n.* a buffoon; merry-andrew.

**Zanzibar** (*zân-sî-bâr*). The name of an East African island, was used before the fifteenth century in a more general sense to denote the East African coast south of the river Jubba. *Zanzibar* is a Port. form of the Arab. *Zanzibar*, which is itself a corruption of the Persian *Zangibar*, or *Zenqubar*, which means "the coast or region of the blacks," the name being formed like *Hindubar*, "the land of the Hindus," or *Motebar*, "the land of the mountains."

**zeal** (*zêl*), *n.* ardor for a cause; fervor.

**Syn.** *ZEAL*, ardor, fervor. *Zeal*, in reference to these other synonyms, is specific, while they are characteristic or habitual; *zeal* is passionate ardor in favor of a person or a cause; *ardor* is simply warmth or heat of passion in love, pursuit, or exertion; *fervor* denotes the constitutional state or temperament of individuals. We speak of the fervor of passion, declamation, supplication, desire, as demonstrative of warmth. *Ardor* is more

deeply seated; as *ardent* friendship, love, *zeal*, devotedness.

**Zealand** (*zê'land*). A province in the Netherlands, "land surrounded by the sea."

**zeal-of** (*zêl'of*), *n.* an enthusiast; fanatic.

**Zeal-of** (*zêl'of*), *n.* one of a fanatical sect of Jews which carried on a desperate struggle with the Romans until the fall of Jerusalem (70 A. D.).

**zeal-ous** (*zêl'us*), *adj.* ardent in the pursuit of an object; enthusiastic. [EAGER.]

**ze-bra** (*zê'bra*), *n.* a wild animal of Africa of the genus *Equus*, with black and white stripes.

**Zebulon** (*zêb'û-lon*). From the Hebrew, meaning "dwelling." Fr. *Zebulon*; Lat. *Zebulon*.

**ze-na-na** (*zê-nâ-nâ*), *n.* in India, that part of a house reserved exclusively for women.

**ze-nith** (*zê'nîth*), *n.* the point in the heavens directly over the head of the spectator; greatest height.

**Zeno** (*zê'nô*). From the Greek *Zeno*. Fr. *Zeno*; Gr. *Zeno*; It. *Zenone*.

**Zenobia** (*zê-nô-bi-â*). Feminine name formed from *Zeno*. Fr. *Zenobie*; Ger. *Zenobia*; It. *Zenobia*; Lat. *Zenobia*.

**zephyr** (*zê'fîr*), *n.* the west wind; soft, gentle breeze.

**ze-ro** (*zê'rô*), *n.* a cipher; nothing; neutral point (0) between any ascending or descending scale or series.

**zeal** (*zêl*), *n.* relish; keen enjoyment.

**zig-zag** (*zîg'zag*), *adj.* having short, sharp turns: *n.* something with short, sharp turns.

**zinc** (*zîng*), *n.* a bluish-white metal.

**zinc-graphy** (*zîng'grâf-î*), *n.* the art of drawing upon, or printing from, zinc plates.

**Zion** (*zî'on*) or **Sion** (*sî'on*). Mount. A hill on which was situated the old city of Jerusalem; the "city of David." Now used symbolically of the Christian church and of heaven.

**Zionism** (*zî-izm*), *n.* a project for the reestablishment of the Jews as a nation in Palestine.

**zith-er** (*zîth'îr*), *n.* a stringed musical instrument, consisting of a sounding box and 26 to 31 strings.

**zo-di-ac** (*zô'di-ak*), *n.* an imaginary broad belt in the heavens, containing the 12 constellations or signs of the zodiac, which the sun traverses annually.

**zô-di-a-cal** (*zô-dî-d'kal*, not *zô'di-a-kal*), *adj.* pertaining to, or situated within, the zodiac.

**Zoe** (*zê'ô* or *zê*). From the Greek name, signifying "life."

**Zo-la-ism** (*zô-lî-izm*), *n.* excessive realism in the literary treatment of the worse side of human life.

or nature, from Emile Zola, the French realistic novelist.

**zone** (*zôn*), *n.* one of the 5 great belts into which the surface of the earth is divided with respect to latitude and temperature; a girdle or belt; *n. f.* to encircle with, or as with, a zone.

**zoo**, *a prefix* meaning animal, as *zochemistry*, animal chemistry.

**zoo** (*zô*), *n.* a park or other large enclosure in which live animals are kept for public exhibition.

**zo-og-og-raphy** (*zô-ô-g'ô-g'ô-grâ-fî*), *n.* the study of the geographical distribution of animals.

**zo-og-ra-phy** (*zô-ô-grâ-fî*), *n.* the description of animals, their forms and habits.

**zo-ô-og-y** (*zô-ô-ô-g'î*), *n.* that part of biology that treats of animals, their structure, classification, habits, and distribution.

**zo-mor-phi-um** (*zô-môr'fî-um*), *n.* the representation of a deity in the form, or with the attributes, of an animal.

**zo-ô-ph-i-lit** (*zô-ô-fî-lîst*), *n.* a lover of animals.

**zo-ô-phy** (*zô-ô-fî*), *n.* an animal of low organization, bearing some external resemblance to a plant.

**zo-ô-og-my** (*zô-ô-ô-mî*), *n.* the dissection or anatomy of animals.

**zou-ave** (*zô-ô-ô-v*), *n.* a soldier of a light infantry corps of the French army, wearing an Arab dress.

**Zu-lu** (*zû'lû*), *n.* one of a warlike tribe of Kaffirs, north of Natal.

**Zululand** (*zû'lû-land*). The country of Zulul.

**Zurich** (*zû'rîch*). A canton and city of Switzerland. Named from the ancient *Thuricum*, "the town of the Thuriel," who built it after it had been destroyed by Attila.

**Zuyder Zee** (*zû'dêr zê*, Dutch *zû'der-zê*). The Dutch for the "South Sea," in relation to the North Sea or German Ocean, of which it is an arm.

**Zwinger** (*zîng'îr*). A famous museum in Dresden. Its picture gallery contains about 2,500 paintings, also collections of drawings, casts, etc.

**zyme** (*zim*), *n.* the germ supposed to be the poisonous cause of zymotic diseases.

**zym-ic** (*zim'îk*), *adj.* produced by fermentation.

**zym-ol-og-y** (*zim-ol'ô-g'î*), *n.* the doctrine of fermentation.

**zym-ol-ic** (*zim-ol'îk*), *n.* a fermentation.

**zym-ol-ic** (*zim-ol'îk*), *adj.* producing fermentation, or a disease in which a virus works through the body like a ferment, as cholera.

**zymur-gy** (*zim'ûr-jî*), *n.* that branch of industrial chemistry which deals with the processes of fermentation in brewing, wine-making, etc.

*far, dek, fol, fite, edra, Anal; met, mâ, hbr; pin, line; not, nôl, for, ônl, fôg; cup, ûet, fôr; for 2, 3, and 3, see Key.*

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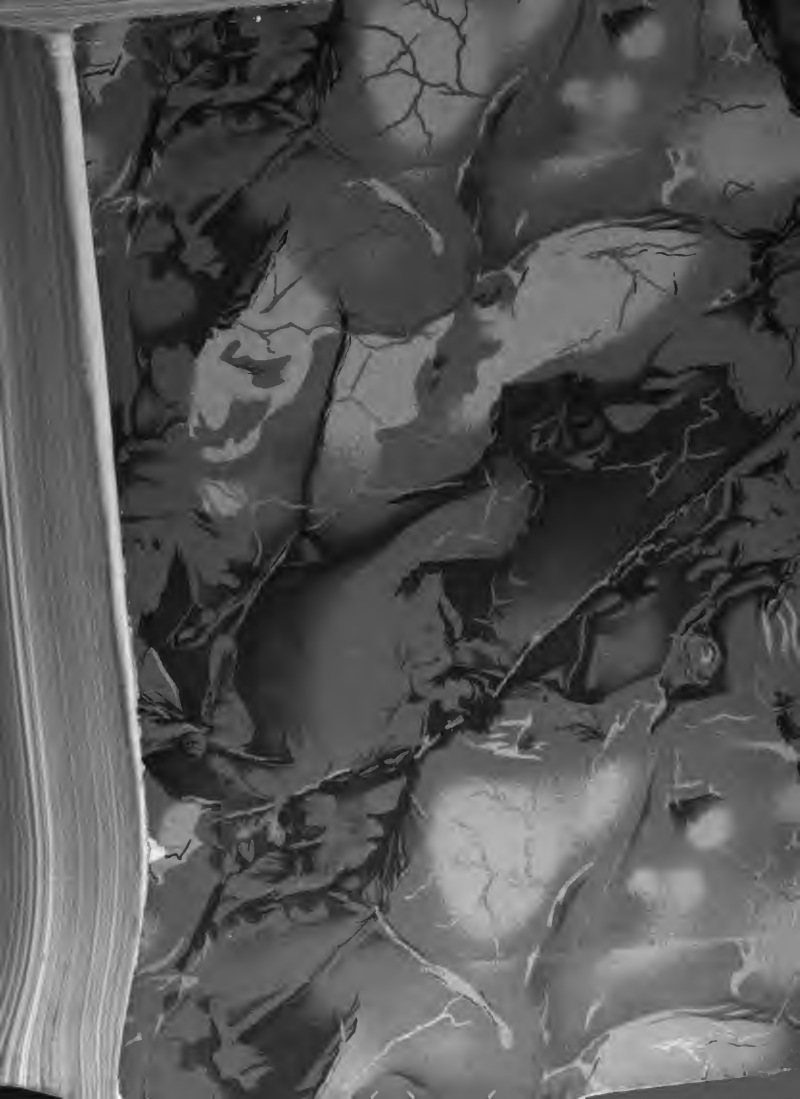
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